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ENVIRONMENTAL ASSESSMENT BOARD

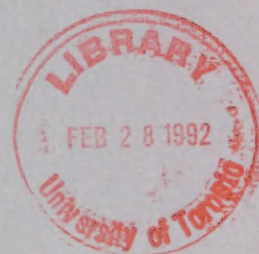
VOLUME: 353

DATE: Tuesday, February 18, 1992

BEFORE:

A. KOVEN Chairman

E. MARTEL Member



FOR HEARING UPDATES CALL (COLLECT CALLS ACCEPTED) (416)963-1249

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL
RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR
TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental
Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental
Assessment for Timber Management on Crown
Lands in Ontario;

- and -

IN THE MATTER of a Notice by The Honourable
Jim Bradley, Minister of the Environment,
requiring the Environmental Assessment
Board to hold a hearing with respect to a
Class Environmental Assessment (No.
NR-AA-30) of an undertaking by the Ministry
of Natural Resources for the activity of
Timber Management on Crown Lands in
Ontario.

Hearing held at the offices of the Ontario
Highway Transport Board, Britannica Building,
151 Bloor Street West, 10th Floor, Toronto,
Ontario, on Tuesday, February 18th, 1992,
commencing at 9:00 a.m.

VOLUME 353

BEFORE:

MRS. ANNE KOVEN
MR. ELIE MARTEL

Chairman
Member



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I N D E X O F P R O C E E D I N G S

<u>Witness:</u>	<u>Page No.</u>
<u>JEFFERY PATCH,</u> <u>JACK WARD THOMAS,</u> <u>RICHARD PAGE</u> ; Resumed.	61411
Continued Direct Examination by Mr. O'Leary	61411

I N D E X O F E X H I B I T S

<u>Exhibit No.</u>	<u>Description</u>	<u>Page No.</u>
2105	57-page report titled: Forest Land Habitat Management Program, Progress Report, October, 1991, authored by New Brunswick Department of Natural Resources and Energy as submitted to Wildlife Habitat Canada.	61412
2106	17-page hard copy of overheads to be used by Dr. Page during presentation re: Habitat Assessment and Planning Tool, and one-page document titled: Winter Habitat Suitability Model Application Procedure.	61446

1 ---Upon commencing at 9:15 a.m.

2 MADAM CHAIR: Good morning. Please be
3 seated.

4 Good morning, Mr. O'Leary.

5 MR. O'LEARY: Good morning, Madam Chair.

6 Just one housingkeeping item and that is
7 in respect of Dr. Page's overhead projections
8 yesterday.

9 You'll recall that there was one
10 projection for which we did not have a copy and that is
11 this one, and we have referred to it as Document 11A,
12 and perhaps we can just attach it to Exhibit 2104.

13 MADAM CHAIR: That's fine, Mr. O'Leary.
14 Thank you. I see there's one in my material already.

15 JEFFREY PATCH,
16 JACK WARD THOMAS,
RICHARD PAGE; Resumed.

17 CONTINUED DIRECT EXAMINATION BY MR. O'LEARY:

18 Q. Mr. Patch, could I just return to you
19 briefly and ask you whether or not you have any
20 additional comments or additional information in
21 respect of the use of habitat supply analysis in New
22 Brunswick?

23 MR. PATCH: A. We have a document, a
24 progress report dated October, 1991 to Wildlife Habitat
25 Canada who are partners in New Brunswick in funding the

1 Forest Land Habitat Management Program. This progress
2 report --

3 MR. O'LEARY: Perhaps I could just
4 interrupt you and provide the Board with copies of this
5 document. We have given a set to the parties as well.

6 Perhaps we can mark that as an exhibit,
7 please.

8 MADAM CHAIR: This will become Exhibit
9 2105 and it's titled: Forest Land Habitat Management
10 Program, Progress Report, October, 1991, by Wildlife
11 Habitat Canada and it has 57 pages.

12 MR. PATCH: Yes. The actual author is
13 the New Brunswick Department of Natural Resources and
14 Energy as submitted to Wildlife Habitat Canada.

15 MADAM CHAIR: Thank you.

16 ---EXHIBIT NO. 2105: 57-page report titled: Forest
17 Land Habitat Management Program,
18 Progress Report, October, 1991,
19 authored by New Brunswick
Department of Natural Resources
and Energy as submitted to
Wildlife Habitat Canada.

20 MR. PATCH: The document can provide
21 background on the program in New Brunswick on habitat
22 relationships efforts, on forest composition objectives
23 and habitat supply analysis procedures, how they're
24 being implemented and public awareness.

25 There are also appendices which provide

1 more detailed information on planning for supply of
2 mature coniferous forest habitat and planning for
3 supply of white-tailed deer critical winter habitat on
4 Crown lands in New Brunswick.

5 MR. O'LEARY: Q. All right, thank you.

6 Dr. Page, if I could come back to you
7 again, and I note in response to question 62 on page 33
8 of the witness statement, which is that portion dealing
9 with the practical role of HSA models in timber
10 management planning, you make reference to the role of
11 expert knowledge in the formulation of the models and
12 the interpretation of the results.

13 In the report found under Tab 17 of the
14 witness statement at page 10 you identify four reasons
15 for user dissatisfaction with the current method of
16 evaluating timber management impacts on wildlife
17 habitat in British Columbia.

18 I ask you: What was the current method
19 in 1989, which is the date when this report was
20 published?

21 DR. PAGE: A. The current method in 1989
22 is the method I referred to yesterday as the referral
23 system.

24 There was a manual evaluation by the
25 various ministries and agencies that had concerns about

1 timber management planning by their regional and, in
2 some cases, district staff if the agency had district
3 staff.

4 The dissatisfaction stemmed from the
5 inability to deal with the relatively high volume of
6 the number of timber management plans that were being
7 submitted for referral and review.

8 Our five-year timber management plans are
9 resubmitted every year, potentially with changes to the
10 previous proposals for harvesting for that particular
11 year, so they must be evaluated anew every single year.

12 The only standardization across the
13 ministries in terms of how to evaluate whether the
14 plans are appropriate are not was very rough and
15 non-binding guidelines, if and when they're available.

16 The mass majority of guidelines that have
17 been produced in British Columbia have never been
18 adopted by the agencies that authored them.

19 MR. MARTEL: Can I ask a question. You
20 said that the plan can be -- is that a work schedule
21 that's looked at every year or the five-year plan
22 itself is looked at every year and can be amended?

23 DR. PAGE: Each year when the --
24 initially there is a five-year development plan for a
25 particular area, each year that plan is resubmitted.

1 Because of the potential difficulties, primarily
2 because of the high costs of accessing some stands, a
3 decision may be made after having learned something,
4 for example, there may be more of a fisheries concern
5 in the placement of a road than they anticipated, the
6 road development will take longer, so they will
7 reschedule between one year and the next, they may
8 reschedule the harvest pattern that was predicted in
9 the five-year plan previously. The entire plan is then
10 resubmitted because that may have impacts in all of the
11 scheduling farther on down.

12 Generally that's not the case. I mean,
13 generally the cut blocks that were scheduled for
14 harvest in the previous year are similarly identified
15 in the coming plan, but there's no requirement in any
16 way to say that there has to be any correlation between
17 last year's five-year plan and this year's five-year
18 plan.

19 MR. MARTEL: So it's like a new ballgame
20 every year?

21 DR. PAGE: Potentially. Practically that
22 would not be very suitable for the forest companies to
23 operate that way or the governments.

24 MR. O'LEARY: Q. Mr. Page, taking you to
25 page 10, in the first set of bullets at page 10, can

1 you relate each of the four bullets that you refer to
2 at that point in the report under Tab 17, can you
3 relate each to the then current method and give us an
4 explanation of what you mean or what is meant by those
5 bullets?

6 DR. PAGE: A. As I mentioned the only
7 ability to interpret the impacts of a timber management
8 plan on other resources was some sort of manual
9 process, occasionally site visits, but generally a
10 manual review of the paper copies of the forest cover
11 maps and scheduling with non-binding and generally
12 vague guidelines.

13 The result was the task was relatively
14 meaningful. It was repetitive in the sense that every
15 single stand had to be evaluated each year to ensure
16 that it was not in some way different from the previous
17 plan. In other words, there wasn't a list: These
18 stands that were scheduled for harvest in year one are
19 now scheduled for harvest in year two.

20 In some cases that's not true, there may
21 be colour coding, but you can imagine the potential
22 difficulties of manually colour coding maps to identify
23 the cut blocks that were previously scheduled for year
24 four that are now scheduled for year one that have
25 subsequently been changed to year two.

1 Q. Can I just stop you there. I thought
2 I heard you say -- you used the word meaningful. Did
3 you mean the word meaningful or menial as appears in
4 bullet 1?

5 A. I meant menial. If I said
6 meaningful, I'm sorry.

7 Q. All right.

8 A. Yes, the tasks actually are -- the
9 menial repetitive tasks became meaningless to the staff
10 that were undertaking them, except for the fact that
11 they tend to be very dedicated and believe that they're
12 doing something very worthwhile for the environment,
13 and because of that, put a lot of effort into their
14 work.

15 The methodology clearly then relies on
16 site-specific knowledge because it's difficult, if not
17 impossible, to evaluate ecological conditions from
18 manually scanning a forest cover map. Ideally they
19 would know the area well enough to be able to interpret
20 that information from the forest cover map because of
21 their own experiences in the area.

22 In many cases, because of the number of
23 plans are being submitted, that precluded them from
24 actually visiting the sites.

25 Thirdly here is the complexity both in

1 space and time of the habitat interactions that were
2 potentially occurring on the landscape. Partly because
3 of that the focus was frequently narrowed to one minor
4 component or one component solely. The component
5 chosen in this particular case was usually deer winter
6 range under severe snow conditions; in other words, the
7 largest trees were evaluated for their ability to
8 provide deer winter range. Another component such as
9 summer range, other species, cavity nesting birds, et
10 cetera, were generally ignored.

11 And finally, as I've alluded to earlier,
12 because of those -- all of those components, the task
13 was extremely time consuming. And other referrals that
14 were come to them, such as the impacts on water quality
15 downstream for municipalities were difficult or
16 impossible to address.

17 Q. Dr. Page, the report then continues
18 on and states:

19 "Use of the HAP tool will help alleviate
20 this problem by...", and you list four
21 further bullets.

22 Can you perhaps elaborate on how each of
23 those four items will help alleviate these problems?

24 A. Well, first of all, most importantly
25 I think is that by automating the process it's

1 relatively easy to track changes in the forest planning
2 schedules from year to year. The computer can
3 relatively easily identify the stands that have changed
4 in their scheduling and highlight those.

5 That's just one of the many examples of
6 the ability to automate the menial tasks. Colouring
7 the maps is another example that is simple, trivial for
8 a computer to do and time consuming for the human.

9 The other thing which I mentioned
10 yesterday was the ability of the application of the
11 assessment procedure to identify critical areas on the
12 landscape where more attention has to be addressed,
13 both at the regional level and at the watershed level,
14 and through that watershed level, to identify the
15 stands where the concerns may be the greatest.

16 So rather than having to visit all the
17 stands that are scheduled for harvesting, we can use
18 the methodology to identify which ones are most
19 important to be identified. The example I used
20 yesterday was, having identified a stand structure
21 based on the forest cover attributes that's sufficient,
22 you may want to visit that site to see if there is
23 browse under the ground -- or under the stand on the
24 ground there.

25 MADAM CHAIR: Excuse me, Dr. Page. In

1 the area that you have applied the HAP program to in
2 British Columbia is primarily Vancouver Island?

3 DR. PAGE: Exclusively so far, yes.

4 MADAM CHAIR: Exclusively so. And did
5 you say there are 10 management units on Vancouver
6 Island?

7 DR. PAGE: In terms of the forest
8 management units there's many more than that. Some of
9 our forest management units are not contiguous; in
10 other words, there's a small chunk on Vancouver Island,
11 there may be some elsewhere, I'm not actually certain
12 how many, and a large component of Vancouver Island
13 is private land as well, the forested land, so I'm not
14 exactly certain how many units are there.

15 What we've been attempting to do is to
16 try and, as mentioned in this report, is to identify
17 another subset of ecological units based on watersheds,
18 some of which may contain two or three timber licences.

19 MADAM CHAIR: What is the size of the
20 forest now under the HAP management?

21 DR. PAGE: We have evaluated it at the
22 regional level at least, the entire island, and that is
23 roughly - that was answered in one of the
24 interrogatories - I believe a million hectares --
25 sorry, I'm getting my -- I'll just look that up.

1 Most of the references to large areas in
2 the undertaking here have been in square kilometres, so
3 the land area of British Columbia is .9-million -- or,
4 .9-million, yes. 900,000 square kilometres of which
5 about 100,000 square kilometres are on Vancouver
6 Island.

7 MADAM CHAIR: And of those 100,000 square
8 kilometres, the HAP approach is being used on just a
9 portion of...

10 DR. PAGE: No. As I said, we've
11 evaluated the entire island with the regional model to
12 identify where it was necessary to assess the
13 watersheds themselves. Those watersheds have been
14 assessed in four larger blocks, more than one watershed
15 in each area.

16 MADAM CHAIR: And does this apply to
17 private lands as well as Crown lands?

18 DR. PAGE: Well, the research area that I
19 will be -- the area that I'll showing you where we have
20 done a lot of our background deer research is actually
21 privately owned land owned by MacMillan Bloedel,
22 they've been involved in the research program for the
23 last decade.

24 And so the scenarios that I'll be showing
25 you here were actually on private land. Clearly

1 then -- those plans did not come to us for referral,
2 clearly there was no need for the company to be
3 concerned with this, other than for their own purposes,
4 it was not imposed on them by the government.

5 That was one of the difficulties we've
6 had, the forest companies have been very interested in
7 dealing with some of these issues with the public and
8 have been able -- have the ability to respond more
9 rapidly than the government last been able to, so we've
10 been under pressure to deliver these tools to the
11 industry in advance of delivering it to our own
12 agencies, and that's generally been unacceptable to the
13 government, they didn't want the industry to be using
14 these tools for evaluation before we had been able to
15 confirm their validity internally.

16 But there have been three substantial
17 areas that have been evaluated under the holdings of
18 MacMillan Bloedel, Fletcher Challenge Canada and
19 Canadian Forest Products.

20 MADAM CHAIR: Thank you.

21 MR. MARTEL: I'm having difficulty,
22 forgive me. I think you said that with the HAP you
23 identify critical areas. Do you go and ground proof
24 all of these areas, you go out and assess them
25 visually, because I think you said you didn't have to,

1 you could use the information without necessitating a
2 trip or a visit out to ground proof it.

3 And if that's the case, how are you sure
4 of what's there? You said occasionally you might go
5 and see if there was enough browse.

6 Do you apply just general principles and
7 say, if it's a certain type of cover we assume there's
8 going to be this type of browse and, therefore, we can
9 assume that it's safe or it's logical to move in and
10 apply HSA in this given area without ground proofing?

11 DR. PAGE: Well, that's one of the areas
12 where you have to understand the uncertainty of your
13 information. In some cases we have very good
14 ecological maps, we have faith that those maps are
15 relatively correct and given that those maps are
16 correct you may be comfortable in assuming that stands
17 that occur in those ecological areas will have good
18 browse.

19 Our ability to predict the amount of deer
20 forage from the ecological associations varies
21 depending upon those associations. Some are, say,
22 marginal in the nutrient content, and depending on
23 other things that have occurred there, like the depth
24 of the soil or whether the stand might have been
25 fertilized, there may or may not be browse in those

1 areas. Those are the kind of places that we can
2 identify as being potentially uncertain and a site
3 visit is necessary.

4 Some other areas, particularly those that
5 have never been previously harvested are relatively
6 standard, the process is there, fairly uniform. And so
7 we find actually that most we will go and do site
8 visit. What we've been able to do largely though is
9 say that these areas, regardless of their attributes,
10 are not going to support deer and there is no need to
11 visit those sites. So it's not as much identifying
12 where the best habitat is but identifying broad areas
13 that cannot possibly contain the best habitat and those
14 areas don't need to be evaluated.

15 So in our case that often is only --
16 that's about 80 per cent of the land area does not need
17 to be evaluated on a stand by stand basis.

18 MR. O'LEARY: Q. Dr. Thomas, I was
19 wondering if perhaps you might have a comment in
20 respect of the American experience?

21 DR. THOMAS: A. We have experiences very
22 similar in the sense that we do have very good
23 information, for example in the area I work, on ecotype
24 and what one would expect under various conditions, the
25 productivity in terms of grasses, forbs, shrubs.

1 In most of those cases we make the
2 assumption that you ask about and proceed along that
3 line. It's not necessary to visit every site, it's
4 maybe necessary to visit one out of every 10 and if the
5 predictions are holding true in that sample, we make
6 the assumption that that is indeed so and we proceed
7 from there.

8 Obviously the more sites you visit the
9 more comfortable you are but, very obviously, the more
10 sites you visit the more it costs. So it's a matter of
11 one, as these things don't have good to be predicated
12 on the idea of what one must do without consideration
13 of what one can do.

14 So, therefore, sometimes the amount of
15 risk you take is related to the amount of money you
16 have to spend on it. So it's a matter of real life
17 combinations of factors. But with good ecotype maps
18 and sampling we are quite -- we feel quite certain we
19 are getting the general ballpark picture.

20 DR. PAGE: A. In Dr. Carr's testimony I
21 believe that he referred to the ecological zonation and
22 some of those programs that have been undertaken in
23 British Columbia and they are parallel to the FEC,
24 including the interpretations manuals that are being
25 produced in Ontario. We just have been doing it for, I

1 believe about 12 years now, and our manuals are farther
2 down the road. Most of the province is covered by
3 site-specific interpretation manuals.

4 And in my research program we do have an
5 interpretations forester whose sole responsibility is
6 to interpret the silvicultural and environmental
7 implications of the ecological units.

8 Q. Dr. Page, could I return you to the
9 bottom of page 10 again, and perhaps you can pick up
10 again, I think you've made mention of the second bullet
11 and perhaps you could move on to the third.

12 A. Yes, I think I was referring to the
13 spatial and temporal complexity which is clearly an
14 area that the computer can deal with. Again, trivially
15 it may take the computer a period of time to compute
16 all the interactions, but it's feasible.

17 It's also something feasible for the
18 human mind to do, but it's considerably time consuming
19 to evaluate all possible combinations of potential
20 forest harvest plans on the landscape manually.

21 And, finally similar, to the final bullet
22 above, because the time required to prepare a response
23 can be reduced, the staff are freed up to continue on
24 with other duties and aren't necessarily restricted to
25 only evaluating timber management plans. There are

1 many other activities in the province, such as mining
2 and agricultural development, that require input from
3 environmental staff, and those traditionally have been
4 given a lower priority.

5 Q. Dr. Page, are these benefits that you
6 indicate are the result of the HAP tool, are they
7 developed and exclusively for the benefit of B.C., or
8 can they be used on a much broader scale?

9 A. The vast majority of what I'll be
10 saying about these kind of forecasting tools and
11 habitat supply analysis is generic to the process. It
12 doesn't particularly matter where you are or who you
13 are, the benefits and the costs are generally similar.

14 The benefits, in particular, can be
15 assumed to be identical in evaluating any forest
16 management plan or timber management plan.
17 Particularly since the complexity, at least in Canada,
18 of our forests is relatively uniform in the ecological
19 areas; the boreal forests of northern Ontario are very
20 similar to the boreal forests across the rest of this
21 country.

22 Q. Dr. Thomas, do you have --

23 MR. MARTEL: Could I ask a question?

24 MR. O'LEARY: Certainly.

25 MR. MARTEL: In fact, maybe two

1 questions. The latter comment you just made, we had
2 this out when Dr. Carr was here about the boreal
3 forests in B.C. being similar to the boreal forests in
4 northern Ontario. I'm not sure I was convinced they
5 were that similar, except maybe in the northern
6 regions.

7 DR. PAGE: Yes.

8 MR. MARTEL: To the south, my viewing of
9 B.C. when I was there was vastly different than Dr.
10 Carr's impression from what he told me when he was
11 here. So that's the first question, are we just
12 talking about the north when we're making that
13 comparison, the Peace River area and so on?

14 The second question though is, what's
15 B.C. going to do with respect to the rest of the
16 province then and the use of HAP, are they going to
17 apply it, have they got a timetable, because I think
18 you suggest we could do it in Ontario in two years.

19 DR. PAGE: Yes.

20 MR. MARTEL: What's B.C.'s agenda for the
21 rest of their province?

22 DR. PAGE: Well, first of all, I maybe
23 should just reaffirm that the document that we've been
24 referring to behind Tab 17 was authored -- the senior
25 author is with the Ministry of Environment not the

1 Ministry of Forests and implementation of these
2 procedures depends on their own Ministry.

3 They have undertaken a number of plans to
4 implement HSA type of modeling across the province.
5 They are doing it on an ecoprovince basis, which is one
6 of our ecological units, and as their prototype -
7 except that they have two prototypes, this is the
8 first - the second was in one of the interior areas,
9 they took a more extensive approach.

10 We focused intensely on two species
11 particularly, black-tailed deer and Roosevelt Elk.
12 They decided to develop more simple models for an array
13 of species, so they developed the kind of models,
14 almost parallel models to the Blue Mountains handbook
15 for 150 species and are now evaluating those.

16 The difficulty with those models is
17 because of their lack of precision they indicated very,
18 very many problems with very many species and I suspect
19 that relates more to the lack of precision of the
20 models than to the true impact on those species. So
21 that would require necessitating stepping back for a
22 moment and evaluating those models and not raising the
23 red flags for the forest management.

24 But clearly in that case the biological
25 information was lacking.

1 MR. MARTEL: But I think you take the
2 possible though, don't you, that you start with what
3 you've got anyway and you move from there, even if you
4 have limited knowledge, and you move ahead.

5 DR. PAGE: Yes. So for some species
6 there was no doubt that there was a concern with the
7 timber management plans, and they are being modified.
8 Those -- and the process was intended to prototype the
9 method in that one area and then into the -- move
10 rapidly into the other eight ecoprovinces in quick
11 succession after that; in other words, about two years
12 down the road.

13 Like us, they found that that very first
14 step is often difficult, not because of any technical,
15 because of problems of changing technology for humans.
16 To move on to the second and third and fourth step,
17 you're moving increasingly rapidly.

18 So if you had asked me that question two
19 years ago I would have said we would undoubtedly be
20 complete by now. So we continue to have forecasts of
21 completing the projects in two years, but the time
22 frame keeps moving ahead of us.

23 The other major, major reason is that the
24 issues in British Columbia are changing more rapidly
25 than we can adapt. We were just getting a handle on

1 old growth and species like spotted owl a few years ago
2 when the spectral biological diversity was raised only
3 about year and a half ago. It is now one of the
4 mainstream issues in forest management in British
5 Columbia; a year and a half ago it was never
6 considered.

7 Those are the issues, those are the
8 difficulties that are delaying implementation. It has
9 nothing necessarily to do with the technology.

10 MR. MARTEL: The technology you think can
11 be applied, it's a case of issues arising that push
12 your agenda back?

13 DR. PAGE: Yes. And one thing that
14 managed to speed that up is that the implementation of
15 this methodology is becoming politicized.

16 We have a number of commissions having
17 been formed in British Columbia, the most recent was
18 announced by our new government, the Commission on Land
19 Use and the Environment and the Ombudsman will be
20 heading that. He was required to make some fairly firm
21 decisions within 18 months and a two-year schedule is
22 too long. We have to have implemented and finalized
23 those decisions in that time frame.

24 MR. MARTEL: Well, my colleague and I
25 have a similar problem, things keep changing here as we

1 go along. We didn't hear much about biodiversity four
2 years ago either. It's become a new buzz word as it is
3 out there and I'm not sure how one can -- you see, you
4 take what you're telling us and you say you can do
5 these things, and I look at your agenda and it gets
6 pushed back, and we've got I don't know how many
7 parties to this hearing - by the way, can't get
8 agreement on anything basically - and how it all ties
9 together is very, very difficult, because your
10 information is we can do it in two years. I think, I
11 don't want to misinterpret it.

12 DR. PAGE: No, we can. And when I say
13 can, I mean that it should be possible to develop and
14 implement these things in two years if we didn't have
15 any problems imposed by the fact that human beings have
16 to do it.

17 MR. MARTEL: Oh, I see.

18 DR. PAGE: Once you --

19 MR. MARTEL: I applaud you for that
20 addendum.

21 DR. PAGE: Once you recognize that, that
22 changes the way you address the impediments. It isn't
23 really a lack of information, it's a lack of peoples'
24 comfort with the information they have; it's not a lack
25 of computer technology, it's a lack of understanding

1 what the technology can or cannot do.

2 MADAM CHAIR: Excuse me, Dr. Page. Isn't
3 it also a question of the mechanics of it. Even if
4 people were to have -- were to welcome doing habitat
5 supply analysis as quickly as they could possibly do
6 it, I think Mr. O'Leary brought up the point yesterday
7 that there was an estimate given to this Board that it
8 would take 20 years to digitize the FRI information in
9 Ontario to allow a very comprehensive type of habitat
10 supply analysis.

11 DR. PAGE: I would suggest it doesn't
12 have to take that long, but once it has started in one
13 spot the HSAs in those areas can be implemented
14 immediately, and even without the digital information
15 that Dr. Thomas has mentioned there are alternatives.

16 The models can be developed and
17 implemented manually, it's just not an efficient way of
18 doing it. The question is not really one of it being
19 too expensive, but that the longer that you wait
20 generally the more you're actually losing when you're
21 implementing new technology if it's cost efficient.

22 MR. MARTEL: You're not suggesting then
23 that one has to apply it right across the area of the
24 undertaking, one could have an implementation schedule,
25 if wanted, saying you have to move ahead on a regular

1 basis otherwise it would stop, but...

2 DR. PAGE: Yes.

3 MR. MARTEL: But you can't expect to do
4 it, the whole thing holus bolus overnight.

5 DR. PAGE: Well, the difference is only
6 between what is feasible and what is deemed practical.
7 It is feasible to do it overnight.

8 To turn a larger amount of private
9 resources, and many of those would not be found within
10 Ontario, there's a large array of contracting
11 organizations across North America that, you know, make
12 their living from digitizing forest cover maps.
13 Obviously many, many more in the U.S. than in Canada,
14 so we have done much of that out of house in British
15 Columbia and I think New Brunswick had the same
16 experience. Those companies --

17 MADAM CHAIR: Excuse me, Dr. Page.

18 DR. PAGE: Yes.

19 MADAM CHAIR: You've done a lot of
20 contracting out of digitizing --

21 DR. PAGE: Digitization.

22 MADAM CHAIR: But you said you have
23 implemented the HAP tool just within the same budget,
24 you didn't receive an increased budget to do this with.

25 DR. PAGE: The digitization was a case --

1 some of this material was I think was developed in the
2 interrogatories slightly, but in 1978 British Columbia
3 received its first GIS and we started digitizing forest
4 cover maps then in-house with the relatively cumbersome
5 system.

6 After about 10 years of doing that, only
7 about half the province had been digitized and the
8 costs were relatively high.

9 And at that point as well --

10 MADAM CHAIR: Excuse me. What were those
11 costs?

12 DR. PAGE: It's difficult to determine
13 because, as I said, there was -- generally there was no
14 extra money, they turned other resources to these new
15 activities.

16 So rather than using manual methods of
17 photointerpretation and developing manual forest cover
18 maps, they were doing it with the use of the
19 technology, they were computerizing the same lines from
20 the air photos they would have manually drawn on a
21 piece of paper previously. That was one of the reasons
22 why it was going on for such a long period of time.

23 Subsequently a special cabinet submission
24 was made for extra money for re-inventory of the
25 province, to start right from the basis of forest

1 inventory which is, in our case, flying aerial photo
2 lines and the inventorying and that was estimated at
3 \$7-million a year for 10 years.

4 But, as I say, the digitizing costs are
5 approximately \$1 per forest cover polygon.

6 MADAM CHAIR: Per stand.

7 DR. PAGE: Yes. And if you separate
8 those costs alone, as opposed from collecting the data
9 that are contained within that stand, it's relatively
10 inexpensive, the vast majority of the costs are still
11 collecting those kind of forest inventory data.

12 MADAM CHAIR: That's been the evidence
13 before the Board, that there isn't a reluctance to
14 certainly use habitat supply analysis techniques, but
15 given the large size of the area of the undertaking in
16 Ontario, the costs of preparing to do that seem to be
17 pretty large.

18 DR. PAGE: Well, these are the data that
19 are required for managing for timber production.

20 MADAM CHAIR: Yes.

21 DR. PAGE: Irrelevant of whether --
22 regardless of whether you intend to introduce HSA, you
23 still need those data, and I would suggest it would be
24 foolish not to have any data on the stands if you were
25 to manage for timber and I think Ontario has a major

1 interest in the forest inventory as well.

2 Those inventory data, once they become
3 digitized or once they become available at all, can be
4 and are used in HSA. And I don't think it's necessary
5 to include all those costs of digitizing forest cover
6 as an HSA initiative when it also primarily increases
7 efficiency in timber supply management, that's the
8 reason it's been done, not because of HSA.

9 Having digitized and computerized and
10 modernized our forest inventory for timber management,
11 we have this ability to also utilize that information
12 for these other resources.

13 MR. O'LEARY: Q. Dr. Page, can I ask you
14 a question - I think I asked this of Mr. Patch
15 yesterday - whether or not it's necessary to digitize
16 GIS in Ontario before HSA could be implemented?

17 DR. PAGE: A. No. Our proven concept in
18 1985, which is referred to in a 1987 document in the
19 transactions of the North American Wildlife Conference,
20 was basically our first manual crack at that.

21 As I mentioned yesterday, where we laid
22 the map down on the table and drew lines around the
23 areas that had food and cover and then the areas that
24 were within a hundred metres and added up those areas.

25 A computer was used only to determine

1 what the areas were as opposed to dot grid or polar
2 perimeter or other methods of figuring out how large
3 the areas were. The evaluations were actually done
4 manually on the map sheet itself.

5 That was our first habitat supply
6 analysis. I think Dr. Thomas may be able to refer to
7 his first habitat supply analysis.

8 Q. Perhaps I could ask you, Dr. Thomas.

9 DR. THOMAS: A. I would like to make
10 several comments that may be useful.

11 The first habitat supply analysis I ever
12 did I was a junior in college and that was some time
13 ago, using rather crude techniques. We didn't even
14 have aerial photos. It could be done and it was done,
15 but the areas were small, and we learned how to do it
16 bigger since, but habitat supply analysis, you have to
17 do the best you can with what you've got. If you don't
18 have GIS, you do it at the next level down, but now
19 we're much farther along, even with aerial photos,
20 landsat imagery a number of those things.

21 But secondly --

22 Q. Can I just stop you there.

23 A. Sure.

24 Q. At that point you say at the next
25 level down. Can you compare that to the existing

1 regime, if you're aware of it in Ontario, or other
2 similar type procedures or processes that are in the
3 United States, and give us your indication of the
4 relative success of this next level down you're talking
5 about in the habitat supply analysis compared to
6 another regime?

7 A. Well, I would tell you that the very
8 best habitat supply analysis is the kind that I did
9 when I was a junior in college, except that was for
10 20,000 acres and it took me six months. We can't
11 afford that. That's still the very best, to be able to
12 actually know every acre.

13 But as you move up from that, the next
14 step up is to be able to type, say for example, from
15 aerial photos, or from aerial observation. The next
16 level up is to be able to have landsat imagery with
17 interpretation, or I mistake -- mispoke, the next step
18 up is to have ecosystem types that one can visualize,
19 know what they are, identify them and make some
20 assumptions.

21 The next level of up is to be able to
22 type at very large scales from landsat or one of those.
23 The next level up is to move to GIS and be able to
24 digitize. But you operate in there. I find it hard to
25 believe that the folks in Ontario are not doing habitat

1 supply analysis. It's largely a matter of what degree
2 that's being applied.

3 Secondly, it might be of some use. In
4 the United States the Forest Service was dragging its
5 feet on moving to these next stages because of these
6 very issues that you're discussing and suddenly we ran
7 smack into the law and the judge said: Hey, if you
8 don't come up to speed here you're not going to move.
9 It was amazing how fast we could begin to move up to
10 speed using what we had at our disposal.

11 Now, we did have to shift priorities.
12 Some people like me that were doing one thing had to
13 shift over and do another, but we could respond and
14 we're still in the process of responding.

15 The other is that, Mr. Martel said, you
16 know, the boreal forest being different, I would
17 encourage you to look at it, if you looked at a tree
18 with branches, at the very top all forests are forests
19 and they have similar attributes, but a tropical forest
20 is different from an evergreen forest, which is
21 different from a ponderosa pine forest, and then within
22 evergreen forests there are 10 different kinds and, as
23 you go down -- they're all alike to some degree, and
24 then you get down to really talking about what the
25 differences are.

1 And the last point that I would make is
2 that you don't have to discover these things
3 independently. For example, in the western U.S. we
4 have joint teams that we meet periodically, we have
5 even published together in terms of these kinds of
6 supply analysis models and approaches.

7 There's no point in the United States
8 government spending exactly what the Canadian
9 government is spending and exactly what state
10 governments is spending to get to the same point. So
11 we've kind of learned how to hold hands to try to get
12 the maximum return for our investment.

13 The elk situation in British Columbia may
14 be different than it is in Oregon, but it's also very
15 much the same. So one can transfer technology rather
16 quickly in terms of basic concepts and ideas but they
17 certainly have to be sharpened for application to local
18 areas.

19 DR. PAGE: A. If I could attempt to
20 summarize briefly. The point that I was fundamentally
21 trying to make is that HSA is a way of using the
22 information that you currently have at whatever level
23 to infer what the impacts of a management dimension are
24 going to be on the habitat for plants and animals,
25 insects and fish and so that you can make a better

1 decision as a land manager.

2 There's no need necessarily to manage
3 exclusively for one resource at a time. It's no more
4 appropriate for us to manage exclusively for moose
5 habitat and ignore timber concerns in the converse.

6 Q. Dr. Page, could I just return you for
7 a moment to Mr. Martel's first question, and I think
8 that was - just put it generally - a comparison between
9 British Columbia and the area of the undertaking.

10 Now, you indicated when we reviewed your
11 curriculum vitae that you were born in Ontario. Can
12 you perhaps give us an idea of your understanding of
13 the area of the undertaking and whether or not you've
14 had any opportunities to visit the area of the
15 undertaking?

16 A. I'm not only extensively familiar
17 with the boreal forest of the area of the undertaking
18 and British Columbia, but also the rest of the western
19 provinces, Quebec, Alaska, Scandinavia and, as I said,
20 those areas are remarkably similar which is clearly, as
21 Dr. Thomas said, not to say they are the same. The
22 differences though are relatively unimportant to the
23 animals.

24 The major difference in Scandinavia is
25 the tree species tends to be Scots pine in much of the

1 moose range, a species which does not naturally occur
2 here, yet those pine forests are very similar
3 ecologically and the moose certainly operate in much
4 the same way as our pine forests.

5 In this particular case, British Columbia
6 and Ontario, that northern part of the boreal forest,
7 as you say, may be similar and it actually is, I mean,
8 that is the area I'm referring to is that -- the
9 lowland area, the higher elevation forests that are
10 termed as boreal are clearly different than from the
11 boreal forests of the low lying areas.

12 I have some slides - I don't think it's
13 necessary to bring them out - but it would be possible
14 to show you a series of slides and it would be
15 impossible to determine which ones came from British
16 Columbia and which ones from Ontario.

17 The differences in the topography and
18 tree species are not discernable, there are no
19 difference in tree species that are important, the
20 differences are not discernable from a photograph.

21 The major difference in those two areas
22 is the relative proportion of soil types. I think Dr.
23 Carr may have referred to that in that there is a
24 slightly higher preponderance in Ontario of the clay
25 soils in that extensive Clay Belt area. Those same

1 soil types occur in British Columbia and in other
2 places, just in a different proportion.

3 Q. In terms of topography, Dr. Page, can
4 you give us your opinion as to whether or not there's
5 any similarity between, you know, the central plateau
6 areas of British Columbia, the northeast, and the area
7 of the undertaking in Ontario?

8 A. Well, though we clearly have areas in
9 British Columbia much more rugged than Ontario, there
10 are also areas, certainly the size of a timber
11 management area or a single forest cover map that are
12 identical in topography to areas of Ontario.

13 The area in northern Ontario close to the
14 north shore of Lake Superior is relatively rugged, even
15 though the elevational difference is only maybe a few
16 hundred -- maybe 400 to 500 metres, that still is a
17 substantial difference for the animals. So those same
18 kind of components I mentioned yesterday in terms of
19 aspect and elevation are really very important there.

20 And I did spend one winter working out of
21 the Terrace Bay District Office in that area looking
22 at -- doing moose surveys, Nagogami, the moose habitat
23 there and the caribou habitat and that was an area I
24 worked in just before I went to British Columbia. I
25 went to northern British Columbia with those images

1 very fresh in my mind and that's why I'm able to say
2 that there's no substantial difference. I could go
3 from one to the other and see the same tree species and
4 the same kind of patterns.

5 Q. And, Dr. Carr (sic), I understand
6 that you have come prepared to give us - my apologies,
7 Dr. Page, too busy talking about topography, I'm still
8 back in Panel No. 3 I guess - but, Dr. Page, I
9 apologize.

10 I understand you've come armed with a
11 brief presentation on the use of habitat supply
12 analysis in British Columbia, and I would invite you to
13 give your presentation at this point.

14 A. I would also like to refer to another
15 exhibit. What I tried to do is summarize the whole
16 process on a single sheet so it's a little easier to
17 refer to. Most of the material on here - I've also
18 placed it up on the wall here - most of the material on
19 here are slides from the overhead presentation
20 yesterday.

21 MR. HANNA: (handed)

22 MR. O'LEARY: We have, first of all,
23 Madam Chair, a copy of the overhead he just referred
24 to. (handed)

25 MADAM CHAIR: Thanks, Mr. O'Leary.

1 MR. O'LEARY: And, secondly, two sets of
2 the overheads he's about to use. Perhaps we could mark
3 those all as one exhibit.

4 MADAM CHAIR: I think that's what we'll
5 do, Mr. O'Leary. This will become Exhibit 2106 and it
6 consists of 17 pages of hard copy of Dr. Page's
7 overhead on Habitat Assessment and Planning Tool, and a
8 one-page entitled: Winter Habitat Suitability Model
9 Application Procedure.

10 DR. PAGE: My colleague, Mr. Angus, is
11 somewhat more wordy than I am and he's responsible for
12 the titles.

13 ---EXHIBIT NO. 2106: 17-page hard copy of overheads to
14 be used by Dr. Page during
15 presentation re: Habitat
16 Assessment and Planning Tool, and
one-page document titled: Winter
Habitat Suitability Model
Application Procedure.

17 DR. PAGE: I refer you here to box No. 1.
18 The first step clearly is to accumulate your data, your
19 maps, get them together. The planometric base refers
20 nothing more than to where the boundaries and perhaps
21 land, where you are, where the lakes and rivers are.

22 Elevation and aspect is an example of an
23 additional layer of information that may be
24 incorporated, but critically important to the habitat
25 supply analysis and to timber management is some

1 understanding of the current vegetation cover. The
2 first source of that information is ordinarily a forest
3 cover map, the first and most important source. The
4 forest cover map contains a phenomenal amount of
5 information about the ability of that area to support
6 animals.

7 No. 2. We go through the rating process.
8 As I mentioned yesterday we, in almost all cases, scale
9 things from 0 to 1. Then you rate the aspects that you
10 think -- the components that you think are important to
11 those animals, such as aspect or as food -- cover value
12 the bar charts on the bottom left are the food value,
13 and the bottom right at box No. 2.

14 And also, as you can see, above the food
15 value graph there, little bar charts of distances.
16 That is how we have rated the ability of animals to
17 move between stands under conditions of different snow
18 accumulation.

19 So when snow is roughly one metre or
20 more, we don't expect animals to venture more than a
21 hundred metres out into a clearcut, if at all. That
22 would be an absolute maximum. Essentially the animals
23 are confined to the forest stands under those snow
24 conditions.

25 No. 3. We have this adding up process,

1 as I mentioned, that hierarchy of taking a couple of
2 attributes, seeing how close they are to each other,
3 adding those up, doing the same thing for other kinds
4 of attributes and adding those up, until you get some
5 sort of overall habitat assessment, a numeric
6 estimation of how well that landscape can support
7 animals.

8 The fourth box here identified as
9 dividing up is not necessarily critical to do, but it
10 is critical to interpret the information. An
11 assessment has to be made of whether something that's
12 related as .2 is adequate to support animals.

13 In our case we've tried to basically
14 scale -- again, with the scale, we have enough analysis
15 to scale our estimates and make our estimates as useful
16 and beneficial to the managers. That's why this 0 to 1
17 scale as opposed to having everything rated in some
18 real quantitative terms like kilograms biomass per
19 hectare of forage available.

20 In this case we tried to scale our
21 parameters so that anything above .5 is adequate to
22 support animals, below .5 it will be considered
23 inadequate. In other words, better than average.

24 And having been able to draw those lines
25 on the continuous scale from 0 to 1, you can now develop

1 these relatively simple summaries such as these pie
2 charts that allow you to see the proportion of the area
3 that is changing after you implement your management
4 scheme.

5 And the pie chart kind of approach, or
6 some simple graphical representation is extremely
7 powerful in conveying whether the overall management
8 scheme is considered a success or a failure. You can
9 visually estimate very quickly whether there's been a
10 reduction in habitat or not.

11 And, as you can see, over the total study
12 area, the lefthand pies there, going from 1985, 20
13 years down the road -- 30 years down the road in this
14 case, there's been a substantial increase in the amount
15 of area that's inadequate support here. Most of that I
16 referred to yesterday.

17 I'll go to the overheads now and I'll
18 give you just an example of how we apply this
19 methodology in British Columbia or elsewhere, which is
20 essentially parallel to the presentation that Mr. Patch
21 made.

22 So HSA for us is primarily a tool, it's
23 not an end in itself, it's a tool to be utilized by
24 forest managers and wildlife managers to better fulfill
25 their agency objectives.

1 It's also a tool that's able to be
2 utilized by forest companies so when they are meeting
3 their objective of producing profit, producing timber,
4 they aren't necessarily having unnecessary impact on
5 the other societal values of that forest.

6 In this particular case we've identified
7 that the objective of this tool is to allow forest and
8 wildlife managers to incorporate wildlife
9 considerations into operational forestry planning, in
10 this case the five-year development plans, and the key
11 there is it's forest and/or wildlife managers, the tool
12 can be used by both.

13 In this particular context the manual
14 method have resulted in a tremendous constrained
15 approach. Extremely large areas relative to the
16 available areas for timber harvest were being deferred,
17 lines are drawn on a map and there was a no-cut within
18 these lines, constrained, and those areas were
19 identified as being critical deer and elk winter ranges
20 by the habitat protection biologist.

21 Initially those areas were deferred for
22 20 years, at which time they would be re-evaluated.
23 Because of the extensive areas that were involved and
24 the large amount of timber and the high value of these
25 timber sites, Cabinet made a decision around 1980 to

1 undertake a research program cooperatively between the
2 Ministry of Environment and the Ministry of Forests to
3 try and resolve this conflict within the agencies so it
4 wouldn't have to be a decision made by Cabinet.

5 MADAM CHAIR: Excuse me, Dr. Page.

6 DR. PAGE: Yes.

7 MADAM CHAIR: Are you saying that the
8 reason, the political reason that the British Columbia
9 government initiated habitat supply analysis was to
10 free up potential wood fiber from reserves?

11 DR. PAGE: Hopefully that would be the
12 result. The hope was that, the reason these were
13 deferred is that though they were considered to be
14 critical for wildlife, they also were critical for
15 survival of the forest industry.

16 By deferring the harvesting for 20 years,
17 hoping for more information, there was a belief that
18 our understanding would hopefully be great enough that
19 we could then harvest that timber and also supply the
20 needs of animals in some other way.

21 There was no knowledge available in 1980
22 to indicate that was likely to be successful, that was
23 the hope, and that was the focus of the initial
24 research project. It was that research project that we
25 were able to draw on to develop the relatively precise

1 tools that we have here because of that body of
2 knowledge.

3 So we had this 10-year long research
4 project, the acronym isn't particularly important other
5 than the R stands for research. What it means is,
6 Intensive Wildlife Intensive Forest Research.

7 One of the ways that we believed that we
8 could provide more wildlife habitat was to have more
9 intensive silviculture management in some of our second
10 growth stands, and that has proven to be a successful
11 method.

12 In other words, wildlife concerns are
13 also incorporated, not just in the timber harvest
14 plans, but in the silvicultural plans. At the time of
15 1980 though these were just hopes, hopes though based
16 on the American experience.

17 And, finally, we were aware of the
18 emergence of these high technology planning tools. As
19 I mentioned, British Columbia already had acquired a
20 GIS by that time and we had hoped that that technology
21 would allow these issues to be resolved more
22 effectively than rancorous discussion behind closed
23 doors; even worse, rancorous discussions before the
24 media.

25 Just some of the underlying concepts of

1 the application of the tool is that we require some
2 ecological units in which to apply it, not
3 administrative units, and we chose watershed boundaries
4 to define our planning units. In our case, because of
5 the focus on deer and elk, those are very acceptable
6 units because they very rarely migrated or move outside
7 of the watershed.

8 The second important component was this
9 was a tool, like any other tool, to aid the managers,
10 to help them make a better decision, it wasn't going to
11 make a decision for them. The tool was going to live
12 or die on its success.

13 And, finally, the principle of OCCAM's
14 razor, which I encouraged before, that in order to be
15 utilized by managers and accepted by them we understood
16 it had to be simple, it had to be understandable. The
17 results then also had to be repeatable and replicable
18 and that would help make the end result of this process
19 defensible in the public forum as well.

20 So we have these three components of the
21 tool; the regional module, the watershed assessment,
22 and the management or silvicultural options and, of
23 course, the tenet of Aldo Leopold, the animals need
24 food and cover and the closer they are the better.

25 This is a figure that I showed first

1 yesterday. I just want to point out this squiggly blob
2 is Vancouver Island, this squiggly blob is Jump Lake,
3 which you will be seeing later on in the maps, forest
4 cover maps. I'll show you how that's the central of
5 this particular watershed with the streams radiating
6 out from it.

7 The other item I would like to mention
8 here is the output in terms of documentation. The
9 decision audit process was necessary to make this
10 methodology understandable and also so we could learn
11 from it in the adaptive management scheme, we could go
12 back and re-evaluate our decisions.

13 And, finally, that this model is
14 hierchical, the structure is very similar at different
15 scales of the model. As we start at a fine scale and
16 add up those components, in this case a broader scale
17 over time from daily movements, to seasonal movements,
18 to annual movements.

19 Now, on to something a bit new. Costs
20 and benefits of the tool. The requirements which are
21 perceived as costs to supply this particular tool are
22 the software, the GIS, and the necessary hardware to
23 make it run efficiently.

24 In British Columbia we initially had a
25 very elaborate GIS which was difficult to operate and

1 required extremely expensive computers, on the order of
2 a million dollars. We now are able to implement
3 exactly the same level of technology 12 years later on
4 personal computers that are identical to those that our
5 secretaries are using for word processing tasks.

6 In our case we knew that there were
7 substantial ecological differences throughout our study
8 area, as I mentioned before, mainly because of soil
9 types. Though we have high rainfall, we also have
10 very, very dry summers; thin, well-drained soils dry
11 out and are poor for producing deer food; poorly
12 drained sites are too wet for producing food; the
13 intermediary sites are the best forage producers.

14 Now that the model has been developed in
15 this particular ecoprovince, even though it was only in
16 one particular area of that ecoprovince, we now feel
17 that there's no new development required. The tool is
18 successful enough that it can be applied by the manager
19 and the results can be believed and accepted. In other
20 words, the development costs don't have to go on
21 forever.

22 MADAM CHAIR: Excuse me, Dr. Page.

23 DR. PAGE: Yes.

24 MADAM CHAIR: The development costs don't
25 have to go on forever, but you do have to update what's

1 going on in the forest?

2 DR. PAGE: Yes.

3 MADAM CHAIR: And that is done how often?

4 DR. PAGE: Well, at least every year--

5 MADAM CHAIR: As often as--

6 DR. PAGE: --as the new plans are
7 implemented. There is a proposal that we've been
8 working on with Mel Detweiler to use satellite
9 technology to update cut blocks essentially
10 instantaneously. That's a case of getting foresters
11 out of the field as well as biologists.

12 MADAM CHAIR: Do you believe that the
13 satellite technology allows you to do that with any
14 precision?

15 DR. PAGE: It allows you to do that with
16 fair precision in flat areas, almost excellent
17 precision in flat areas. It's much more difficult in
18 areas with rugged topography because of the
19 difficulties of correcting.

20 As an example, the satellite is high in
21 space, if the area below it is flat, it can determine
22 exactly where things are; if some of that area is
23 mountainous or is curved, the satellite has difficulty
24 distinguishing the difference between something being
25 high in elevation or closer.

1 In other words, in British Columbia we
2 may have some difficulties in some areas applying that
3 technology, but in Ontario the difficulties are much
4 less, in that particular case of identifying solely
5 where a cut block boundary is.

6 The other component - and there are many
7 initiatives underway in Ontario as well as British
8 Columbia - is to use the new generation of satellites
9 to actually develop things such as forest cover maps
10 for at least some fairly detailed estimate of what
11 occurs on the ground.

12 It could be things such as siltation in
13 the stream due to timber harvesting, or the outflow
14 into a lake, which is easy to identify from a satellite
15 image, or something as potentially elaborate as the
16 understory under a canopy of the forest. The more
17 elaborate information, such as the understory, the less
18 likely the computer -- the satellite will be able to do
19 that for you.

20 MADAM CHAIR: Mm-hmm.

21 DR. PAGE: But, as I said, our maps are
22 updated at least every year as they're submitted. The
23 information on those maps may be quite old. Roughly
24 every 10 years we will attempt to re-inventory the
25 forest and update all those data.

1 Between that time period, as in Ontario,
2 the future forests are projected. Growth and yield
3 models are applied to each stand every year and then
4 the new information is projected in the subsequent
5 years. Each stand will have information for when those
6 data were actually collected; in other words, are we
7 only one year away from the actual data collection, are
8 we now 10 years down the road from when that stand was
9 inventoried.

10 MADAM CHAIR: Mm-hmm.

11 DR. PAGE: The benefits of the
12 application of this tool are reduced time and manpower
13 to both prepare and evaluate the plans, the ability to
14 evaluate tradeoffs between harvesting and silvicultural
15 options. As I mentioned, the constraint approach said:
16 Do not harvest.

17 Rather than dealing solely with the
18 harvesting plan we may be able to substitute habitat by
19 silvicultural options: By thinning stands, to
20 represent the broken canopy of old growth forests; by
21 retaining other tree species besides the dominant crop
22 tree, we may provide forage, and an array of other
23 methods and; finally and ultimately, better management
24 of both the forest and wildlife resources. In the case
25 of forest here, substitute timber.

1 This particular study area is part of the
2 private holdings of MacMillan Bloedel and it's an
3 11,000-hectare area on southern Vancouver Island and 20
4 per cent of the first growth timber is still remaining.

5 The assumption of this particular
6 analysis is that there is a method for managing the
7 second growth forest to provide deer winter range at a
8 relatively young age of that forest, not just extended
9 rotations.

10 We have developed a method, to have the
11 first -- we have applied the method, to have the first
12 successful proof requires 20 years. In our particular
13 case we thin forests at 15 years in this particular
14 manner that we think will allow them to function as
15 deer winter range when they're 40 years old.

16 And, as an important note here, the
17 average timber volume in this particular area is 650
18 cubic metres per hectare, which is substantially
19 greater than the area of the undertaking. It's also
20 the reason why an issue such as constraint management
21 approach goes to Cabinet.

22 MADAM CHAIR: Excuse me, Dr. Page. One
23 question with respect to the statement on the previous
24 slide that the area is private land with about 20 per
25 cent of the first growth timber remaining.

1 DR. PAGE: Yes.

2 MADAM CHAIR: 80 per cent has been
3 removed, and has that been by clearcutting?

4 DR. PAGE: In all cases, yes. Very
5 little of British Columbia is left to be harvested, I
6 believe it's only about 12 per cent of the land area.

7 And the proviso to this particular
8 example is that the summary tables at the end, the pie
9 charts or whatever, are clearly specific to that
10 particular area. The amount of old growth remaining
11 determines, to a large extent, in this particular case,
12 how much suitable severe winter range is out there.

13 And since what we're suggesting is that
14 there's basically three different kinds of winter
15 habitat for these animals, moose included: There are
16 stands that are ideal that contain both the cover and
17 the food necessary; there's stands that provide cover
18 close to or adjacent to the stands that provide food -
19 which is a scenario that the moose guidelines in
20 Ontario focus on, providing a clearcut of small size
21 and provide food adjacent to an older forest to provide
22 cover - and, finally, this third type, which is the
23 managed second growth forest that, if we are
24 successful, will combine both food and cover within a
25 single stand.

1 We don't know if these stands are
2 substitutatable; in other words, how much area of old
3 growth is equal to how much area of managed second
4 growth forest, but we can identify how much of each
5 exists.

6 I said the main reason for that is that
7 our managed forests are not old enough yet after our
8 manipulation to evaluate whether we've been successful.

9 So this, just on the overhead, is the
10 forest cover map for this area simplified to only show
11 the age structure. So here's the lake that I referred
12 to in the centre of the study area. The drainage
13 pattern is indicated on here as well, and the key
14 indicates the age-classes.

15 The cross-hatched areas are the old
16 growth forests, some of which have been voluntarily
17 deferred from harvesting by the company as well 10
18 years ago. Even though this is private land they
19 decided not to harvest two of these particular winter
20 ranges, one just north of Jump Lake and one another
21 five kilometres or so north on south facing slopes.

22 The proposal in this area is essentially
23 to remove all the remaining old growth in the next 15
24 to 20 years, and that was a scenario that we wanted to
25 evaluate.

1 The red areas in here indicate the young
2 second growth forests that are now potential clearcuts,
3 they are 0 to 10, 15 years old and, as you can see,
4 there has been a relatively intensive harvest in a
5 short period of time there, considering that there is
6 some areas that have been harvested as long as 70 years
7 ago. This has clearly had multiple increase.

8 MADAM CHAIR: Excuse me. I'm sorry, Dr.
9 Page. When you said that the plan was to harvest the
10 remaining old growth, the 120 plus age-class, is there
11 no other provision under timber management planning in
12 British Columbia that would call for some old growth
13 forest to be left?

14 DR. PAGE: Because this is private land
15 there are no constraints imposed by government on this
16 land base. We haven't -- there is an old growth
17 strategy underway right now, the report of that
18 committee and strategy has just been released and it's
19 out for public review right now.

20 In terms of -- so to answer your
21 question, there is a concern about old growth supply in
22 British Columbia because many of those coastal old
23 growth forests require 300 to 400 years to develop
24 fully, it's not a decision that we can be incorrect in
25 and recover from our mistake rapidly.

1 MADAM CHAIR: Well, on Crown land would
2 old growth forest be left for other reasons?

3 DR. PAGE: Currently only for some
4 constraint reason without the application of this tool.
5 In other words, a deer or elk winter range or, in some
6 cases, entire watersheds have been skipped over because
7 of the concern for the old growth values in those
8 stands. Those values have been imposed externally by
9 the public through our commissions and through public
10 appeals.

11 MADAM CHAIR: And do you also protect
12 tourism operations or...

13 DR. PAGE: That is a concern, especially
14 the aesthetic component of forest harvesting; in other
15 words, square cut blocks beside the highway on a
16 hillside that is visible are considered aesthetically
17 unpleasing.

18 There are a lot of landscape management
19 approaches to scallop those edges and to ensure what we
20 call green-up of adjacent cut blocks; in other words,
21 you don't harvest one block until the one beside it is
22 green.

23 MR. MARTEL: Can I ask you a question,
24 because we've heard a good deal about the watershed in
25 previous -- and the difficulty in establishing the

1 watershed, particularly in northern Ontario, where I
2 don't think we've got any sort of agreement how one
3 calculates that and one is looking at cumulative
4 impacts or whether they're there or not and the
5 establishment of what the watershed would be,
6 particularly there where you have about 200,000 water
7 bodies, lakes, rivers.

8 This one seems relatively - I shouldn't
9 say simple - but how difficult, in your opinion, is it
10 to determine the watershed and all the sources that
11 feed into that for establishing your sort of analysis
12 and the tools that you're using?

13 DR. PAGE: If there's a stream network
14 there's essentially no difficulty, except to identify
15 where that height of land is; in other words, when you
16 drop a drop of water here, is it going to run this way
17 or this way.

18 If you're out there on the landscape,
19 that decision can often be made; when you're in the
20 office looking at a forest cover map, it's often
21 difficult.

22 It's I think less important to worry
23 about where that line goes, other than to say: We're
24 going to put lines down on the map because we think
25 these represent drainage patterns that may have

1 ecological value as opposed to arbitrary units that are
2 square blocks or some other size and shape.

3 If there is a clear drainage pattern, in
4 many cases in Ontario there is and it isn't difficult
5 to identify watersheds, then that must have a major
6 impact on the environmental effects.

7 If there is some sort of siltation or
8 other problem or a need to buffer, leave buffers around
9 a stream, those benefits will also be affected -- will
10 be felt downstream including on upstream. So at that
11 level it's not difficult to identify what the watershed
12 is.

13 The second component of that is, having
14 identified all the drainage patterns, which of those
15 drainage patterns do you accumulate or do you split up
16 into your planning units.

17 And we've taken what I think is a
18 systematically practical approach is conveniently sized
19 chunks of: How comfortable are the managers with areas
20 of, say, 20,000 hectares, are you willing to make your
21 decision based on an area that encompasses a single
22 forest cover map, and that's largely related to this
23 kind of scale, fairly human scale that we've taken.

24 So some watersheds are very large, we
25 actually have to break them up into 20,000-hectare

1 chunks; other watersheds are small and we aggregate
2 them into convenient 20,000-hectare chunks.

3 The important component there though I
4 think is it is the landscape that determines the
5 planning units and not an arbitrary criteria.

6 MADAM CHAIR: I think that's typically
7 the forester's kind of perspective on it. There are
8 more practical problems with respect to enforcing
9 regulations and to ensure that what's being done in the
10 field is being done in the way that we want that calls
11 for something a little firmer than lines that can
12 change or...

13 DR. PAGE: Well, as I said, once you've
14 determined those lines they don't necessarily have to
15 change because you find out that there might be a
16 slight difference in the topography. Those can be
17 adequate planning units, and they're much better
18 planning units than many of our units in the past.

19 Our planning units were called
20 compartments in British Columbia, and still are, and
21 they are relatively square boundaries that identify
22 conveniently sized square chunks of the landscape,
23 sometimes based on access, historic access patterns not
24 related in any other way to forest management needs.

25 There's been a common agreement among --

1 there's been no disagreement in British Columbia that
2 the watershed level defines our planning units of the
3 future. But exactly your question of who defines them,
4 how important is it that they be perfect is the only
5 issue of debate right now.

6 One component we're using in aggregating
7 those units is what we are calling the resource
8 emphasis areas. We're trying to -- having identified
9 these fairly small chunks of land, say 5,000 hectares,
10 we want to aggregate them, we intend to do that based
11 on areas that have similar attributes in terms of
12 resources, and that's all resources that are of issue:
13 timber, wildlife, recreation, the list obviously goes
14 on.

15 So that when you make a decision in that
16 area, it's a relatively valid decision for the entire
17 area. You don't have to emphasize timber management
18 from one area, deer winter range management in another
19 area, et cetera.

20 MADAM CHAIR: Dr. Page, we normally take
21 our morning break at this time.

22 Mr. O'Leary, how long will Dr. Page's
23 examination-in-chief continue after this presentation?

24 MR. O'LEARY: Well, subject to other
25 questions arising out of the chief, it would take I

1 would think the balance of the morning.

2 MADAM CHAIR: All right. Let's take our
3 break. We will be back in 20 minutes.

4 ---Recess at 10:30 a.m.

5 ---On resuming at 10:55 a.m.

6 MADAM CHAIR: Please be seated.

7 Dr. Page.

8 DR. PAGE: In that introductory part of
9 the presentation I identified what is particularly
10 unique about that one situation and some of the
11 situations in British Columbia, now it's time to get
12 back to a real forest and what's relevant to these
13 hearings, decided to use that information for better
14 forest management.

15 As I said, this is a representation of
16 the age-class derived from the forest cover map,
17 exactly identical to the maps Mr. Patch has on the wall
18 over there, and exactly the same sorts of information
19 as they have in Ontario, whether digital or otherwise.

20 The other source of information -- that
21 may be sufficient depending on your HSA.

22 The other potential source of information
23 is some understanding of the ecological units, in this
24 case, determined by moisture class or soil type which,
25 again, is information that's generally available for

1 all the area of the undertaking.

2 The sources of information are generic to
3 all good timber management and very few organizations
4 any longer don't have these sources of information.

5 The existence of this information for timber management
6 allows it to be utilized in the habitat supply analysis
7 methodology.

8 In this case, we think it's important to
9 identify the mesic from -- or intermediate moisture
10 sites from those that are very wet or very dry.

11 In northern Ontario many of the very wet
12 sites, the bog sites, can have a very significant
13 shelter component to moose in the critical areas in the
14 summertime.

15 And here's the representation of the
16 timber harvesting plan in the initial scenario, and
17 given that this is a privately owned and controlled
18 area, this may be the scenario that is used, which is
19 to remove all the remaining old growth and also to
20 remove all the current severe winter habitat, and this
21 results in a timber flow of 79,000 cubic metres per
22 year over the course of these 20 years.

23 As you can see, the scheduling of the cut
24 blocks is relatively diverse, it's scattered throughout
25 the area, and that kind of scheduling tends to be much

1 more beneficial for an animal like deer or moose that
2 requires edge kind of patterns rather than removing all
3 the timber from a single large block in a single year.

4 MADAM CHAIR: Excuse me, Dr. Page.

5 DR. PAGE: Yes.

6 MADAM CHAIR: In British Columbia, do you
7 have limits on clearcut size?

8 DR. PAGE: None that I'm aware of.
9 Though there is a proposal which I have only seen
10 reported in the newspaper to place suggested limits on
11 cut block size on Vancouver Island, and the cut block
12 sizes now are generally determined by the similarity of
13 the forest stands and the needs of the mills on
14 Vancouver Island, and that's why there was a desire to
15 change that.

16 Cut block sizes in the boreal forest in
17 the northern areas are determined, just as Ontario, for
18 other timber management purposes, unless there is a
19 wildlife constraint imposed.

20 MADAM CHAIR: And with respect to the map
21 you just showed us, has your approach to managing
22 wildlife habitat caused any size limitations on the
23 proposed harvest blocks?

24 DR. PAGE: One of the reasons why this
25 area is such an interesting example is it is privately

1 owned land and timber has basically been the only
2 motivation here. There's been so many entries to this
3 area because it's close to the mill; in other words,
4 they've been able to retain some timber close to the
5 mill so it's available when they have needed it.

6 If the area was more remote, if it was
7 remote in northern Ontario, maybe a railway was
8 necessary to access the timber, there is much less
9 desire to schedule that harvest over a very long period
10 of time to minimize those access costs that will incur.
11 Though in many cases it's better to extend the access
12 than to attempt to move the town and the mill site.

13 An alternative scenario, which might be
14 the one that was imposed if this was Crown land under
15 the constraint management system, would be to cut no
16 severe winter habitat. This is to have a major impact
17 on the timber supply. Reducing the harvest from 79,000
18 cubic metres to 59,000 cubic metres may actually place
19 this proposal into the realm of being economically
20 inviable.

21 Many of the costs associated with
22 accessing and removing these timber supplies are
23 relatively fixed and a reduction in the timber supply
24 timber flow from the harvest scheme with fixed costs
25 clearly means a substantial reduction of profit.

1 If these constraints are not necessary to
2 provide habitat for the animal of concern, then it's an
3 unnecessary restriction on the industry. The only way
4 to evaluate whether these constraints are necessary or
5 not is through the habitat supply analysis method.

6 In the third scenario, which is developed
7 through the iterative process between the wildlife and
8 timber manager is to try and maintain the harvest rate.
9 In this case we are successful at 79,000 cubic metres
10 per year; in other words, the solution to this problem
11 was not to alter the rate of harvest but merely to
12 alter some of the scheduling and then to change
13 silviculturally.

14 The red cross-hatched areas here are
15 those areas where we are able to manage the second
16 growth forest to provide some of that habitat. Another
17 advantage of this particular method is that some of
18 those blocks --

19 MR. MARTEL: What specifically do you
20 have in mind when you say you would manage the second
21 growth?

22 DR. PAGE: In this particular case we
23 actually have a large book, a large land management
24 handbook it's called, that identifies all the various
25 options that are available silviculturally to improve

1 habitat.

2 The principle in this particular case is
3 that rather than having a single uniform stand density
4 with a relatively tight canopy, develop a closed canopy
5 and little or no understory, which is what you would
6 probably do to maximize fiber production, as we thin
7 that stand in the first pass in a patchy manner. So
8 openings are left in the canopy. Those openings allow
9 the browse that would have been killed by canopy
10 closure to survive into the older forests. It also
11 allows that young forest to replicate some of those
12 characteristics of an older forest, such as a patchy
13 canopy.

14 One of the other things I mentioned is
15 that there may be species of non-commercial crop trees,
16 of non-commercial trees there that may be browse
17 species, and rather than being removed from the stand,
18 those are just topped. But those are the kinds of
19 methods that are potentially available once you
20 understand your system and the requirements of the
21 animal that can be included in your habitat supply
22 analysis.

23 What the manager is doing there in
24 evaluating the timber harvest plan is looking into time
25 to evaluate how that stand can be managed to benefit

1 the wildlife with a minimal impact on the timber
2 supply.

3 There are similar schemes of
4 silvicultural management throughout the United States,
5 particularly in Alaska in the boreal forest regions, to
6 provide exactly these same kind of habitat attributes.
7 Some of those have also been tried in eastern North
8 America such as crushing areas of non-timber to
9 increase browse production and the application and use
10 of herbicides.

11 MR. O'LEARY: Q. Dr. Page, I wonder if I
12 could just ask you in respect of the alternatives that
13 you've directed the Board's attention to, if we looked
14 at Ontario, is there sufficient information available
15 today which would allow your colleagues in Ontario to
16 come up with the same three alternatives and possibly
17 the same resolution without GIS technology?

18 DR. PAGE: A. Scenario 1 and 2 are
19 essentially the scenarios that exist in Ontario.
20 Scenario 1 is timber only management. Scenario 2 is
21 the constraint approach using moose guidelines for the
22 majority of habitat -- not majority, but sufficient
23 habitat is just not harvested, imposing patterns on the
24 timber management plan that are potentially detrimental
25 to the timber flow.

1 Q. And is there sufficient information
2 available then to develop what you have referred to as
3 scenario 3 which appears to be the preferred
4 alternative?

5 A. There's no doubt there's sufficient
6 information, what has to be recognized is that there is
7 often a better method between the two extremes, and
8 those methods must be evaluated. The information
9 exists to come up with alternate solutions to a simple
10 constraint management approach and to apply it.

11 MADAM CHAIR: Dr. Page, could you show us
12 again, where are the 650 hectares on that map that
13 you're going to -- or that you would plan to manage as
14 severe winter habitat?

15 DR. PAGE: These red cross-hatched areas
16 here are the younger aged forest, the second growth
17 forest that will be managed.

18 MADAM CHAIR: And combined those equal
19 650 hectares?

20 DR. PAGE: Yes. And, as you can see, in
21 many cases they're adjacent to a recent clearcut which
22 is the horizontal -- well, the scheduling is various,
23 but adjacent to what previously had been an old growth
24 winter range.

25 MADAM CHAIR: And there will be logging

1 in those areas?

2 DR. PAGE: Yes. In this particular -- if
3 you look at this particular example, this is where this
4 lake is, the north side of the lake, this area here
5 with the horizontal lines was previously the old growth
6 stand, it is removed once the second growth that is
7 adjacent, which was harvested roughly 30 years
8 previously, comes up to the standard of second growth
9 required in the second growth management scheme.

10 MADAM CHAIR: But my question is: That
11 cross-hatched area north of Jump Lake, the one you had
12 the pointer on--

13 DR. PAGE: Yes.

14 MADAM CHAIR: --will or will not be
15 logged for some period of time?

16 DR. PAGE: The cross-hatched area has
17 been logged previously.

18 MADAM CHAIR: Yes.

19 DR. PAGE: In the thinning regime, a
20 standard silvicultural practice, we just thin
21 differently. It will still be harvested as second
22 growth at its normal rotation age.

23 So what we're able to do is, rather than
24 having that area move from being a food producing area
25 when it's a clearcut to only a cover producing area as

1 an older second growth stand at the rotation age of,
2 say, 80 years and being harvested, we have extended the
3 ability of that stand to produce food after it produced
4 cover so it can function as a winter range.

5 MADAM CHAIR: Now, how old is that --
6 sorry, I don't mean to be -- how old is that stand
7 today?

8 DR. PAGE: Oh, I think I mentioned
9 earlier that this particular proposal - and this is
10 just one of many options - this particular proposal
11 identifies, you can thin these stands in a different
12 manner when they're 15 to 20 years old and by the time
13 they're 35 to 60 years old, they will then function as
14 deer winter ranges.

15 So you have to anticipate and plan into
16 the future your harvest schedule and your silvicultural
17 schedule simultaneously, or at least in concert with
18 each other so you can make sure that when you harvest
19 those stands you have other options available.

20 If, for example, we had never done any
21 management of the second growth in this area, now we
22 want to harvest the timber, we would not be able to and
23 also provide the habitat because habitat will not come
24 on line for 15 years or 10 years at least after we have
25 manipulated it.

1 MADAM CHAIR: But the age of those stands
2 that are now identified as 650 managed hectares--

3 DR. PAGE: Yes.

4 MADAM CHAIR: --are they various ages,
5 mostly young age-classes?

6 DR. PAGE: They are all young
7 age-classes.

8 MADAM CHAIR: They're all young
9 age-classes. So as they grow over the rotation they
10 will substitute for wildlife habitat.

11 DR. PAGE: For a period of time and then
12 they will be harvested at the normal rotation age, yes.

13 MADAM CHAIR: Are you managing - in this
14 proposal, I understand this is a proposal - are you
15 setting aside any managed areas that are now old
16 growth?

17 DR. PAGE: For this particular proposal,
18 not at all. There is an old growth stand at the valley
19 bottom here which has been identified as an elk winter
20 range and that isn't on this particular example, we're
21 only focussing on this one species.

22 But, in that case, the company has not
23 included that particular stand in this proposal.

24 MADAM CHAIR: So, in effect, your
25 wildlife biologists have judged that you can cut all

1 the old growth, you can harvest the old growth stands
2 in this area and the animals will still be able to find
3 habitat within the remaining stands and in the future
4 by way of this 650-hectare managed area?

5 DR. PAGE: Yes. As you'll see in the
6 summary slide, we believe that if this proposal is
7 implemented and is successful that we can have our cake
8 and eat it too. We can harvest all the remaining old
9 growth timber and also continue to provide wildlife
10 habitat.

11 And we are incurring silvicultural costs,
12 some minor silvicultural costs without incurring any
13 necessary costs in the harvest schedule.

14 MR. MARTEL: That's what I want to ask
15 you about.

16 MADAM CHAIR: Yes, go ahead.

17 MR. MARTEL: I'm looking at some of those
18 cuts, let's say -- let's go right back to the same
19 area, Dr. Page, that my colleague -- just north of the
20 lake there, and you have the managed area and then you
21 have the cut 2006 to 2010 and then you have the two
22 thousand -- or 1991 to 1995, the little green area
23 there.

24 DR. PAGE: Yes.

25 MR. MARTEL: How small an area -- I mean,

1 we have heard evidence at this hearing that do
2 different types of harvesting, for example, with a
3 one-coup, two-coup, three-coup system becomes very,
4 very prohibitive because of costs when one goes back,
5 maintaining the roads, the fact that you don't get
6 enough volume - in fact, part of the opposition to some
7 buffers is that when you go back some of the buffers,
8 it isn't worthwhile going back to take the wood that's
9 there - and yet I look at that area, that little green
10 area, and there are similar ones. How big are they,
11 just approximately, you know?

12 DR. PAGE: Those areas are fairly large,
13 they are multiple stands, but the problem you
14 identified is clearly the problem of the constraint
15 approach.

16 Those areas are set aside for some reason
17 that doesn't include the impact on the timber harvest
18 and if those areas were set aside for a constraint
19 approach and they are subsequently too small to return
20 to harvest them --

21 MR. MARTEL: What's the difference here
22 though? You go back to harvest that eventually anyway
23 and it's still small, it doesn't get any bigger.

24 And the objection here has been that, I
25 think, that to leave an area like that, even in the

1 form of a buffer, there isn't enough fiber to go back
2 to take it out, and you might get enough fiber there.

3 But forgetting the constraint for the
4 moment, I suspect the argument we would get is that
5 each of those areas of that size, that maintaining
6 roads for 15 years or access, or trying to go back
7 because the amount of fiber is so small, it isn't
8 worthwhile in anyone's effort to go back and take it
9 out.

10 It has nothing to do with the constraint,
11 it just isn't -- there isn't sufficient volume of wood,
12 leaving such an area to go back and take it out because
13 if one looks at an area in northern Ontario, let's say
14 where there's black spruce, the amount of fiber per
15 hectare doesn't come remotely close to what one would
16 get in B.C.

17 And that, as I say, doesn't have anything
18 to do with the constraint, so far as I understand it,
19 but simply economics. It ain't worthwhile going back,
20 or to maintain the roads for 15 years to go back.

21 DR. PAGE: That scenario you just
22 identified does never have to exist though if you
23 evaluate that kind of feasibility.

24 MR. MARTEL: But you're stuck with those
25 plots out there like you're showing us. I'm simply

1 going by what you're demonstrating and I'm trying to
2 get by the impasse.

3 I understand what you're trying to do, I
4 understand what I've heard for years, you know, this
5 process goes on and on and on, and I have heard no one
6 who would say they would go back and take a chunk like
7 that size out, regardless of why it's there.

8 DR. PAGE: Well, I'll remind you that
9 this is a privately owned holding and the company has
10 returned to this kind of pattern for nothing more than
11 timber supply purposes. So, in this particular case,
12 there is sufficient -- and, as I said, these are not
13 actually small areas, these are fairly large cut blocks
14 there.

15 MR. MARTEL: Yes. But if one looks at
16 the cut hatch, you say that's only 650.

17 DR. PAGE: These cross-hatched areas--

18 MR. MARTEL: Yes.

19 DR. PAGE: --650 hectares.

20 MR. MARTEL: Yes.

21 DR. PAGE: That is only one smaller
22 component of the whole --

23 MR. MARTEL: But you're saying that total
24 amount that we see there is equivalent to about 650
25 hectares. Are you only going to manage for 650, or

1 maybe I'm misunderstanding it, Dr. Page. It says
2 manage 650 hectares as severe winter habitat, that's
3 the cross-hatched area; isn't it, managed second
4 growth?

5 DR. PAGE: Yes.

6 MR. MARTEL: That is the same area we're
7 talking about?

8 DR. PAGE: These.

9 MR. MARTEL: Are we talking about the
10 total volume, or the total area that we see is
11 equivalent to 650 hectares in that map?

12 DR. PAGE: The entire area within the
13 boundary here is 11,000 hectares.

14 MR. MARTEL: No, no, but in the
15 cross-hatched --

16 DR. PAGE: And the cross-hatched area is
17 650 hectares of that total, yes.

18 MR. MARTEL: Okay. Now, I want to look at
19 the green again, I want to go back, because that
20 represents relatively small -- some of those must be
21 what, 10, 15 hectares?

22 MR. PATCH: No, no, 50 to a hundred.

23 DR. PAGE: Yes. The smallest is probably
24 going to be one hundred hectares in total extent.

25 DR. THOMAS: Could I please --

1 MR. MARTEL: Yes, somebody help me.

2 DR. THOMAS: Well, this is an example of
3 something that's really happening, and their haul
4 distance -- the company's doing this, it must be
5 economically feasible. That doesn't mean that that
6 exact -- he was suggesting that exact pattern.

7 MR. MARTEL: No, I understand.

8 DR. THOMAS: The cutting blocks could be
9 much larger if one chose to do that.

10 MR. MARTEL: Okay, maybe that's where we
11 move, because the volume of wood differs very
12 significantly in northern Ontario per hectare than one
13 would get on the west coast.

14 And what you're suggesting is that we
15 would move to much -- not much, but somewhat bigger
16 sizes in order to recoup the amount of wood necessary
17 to make it economically viable.

18 DR. THOMAS: You have that opportunity.
19 This is merely one example that he's showing you. The
20 principles are what he wants you to see, I think, not
21 the exact block cut size.

22 MR. MARTEL: No, no, I'm not worried
23 about those cuts.

24 DR. PAGE: And these cuts -- this is the
25 final pass, these cut sizes -- block sizes generally

1 are much smaller than the initial harvest.

2 What I tried to point out before was that
3 after the imposition of the moose guideline approach
4 those individual patches are very, very small. My
5 understanding, the areas I have seen where the
6 guidelines have been imposed, those patches I believe
7 are on that order you were referring to; aren't they,
8 of 20, sometimes only 20 hectares and the buffer strips
9 can be 20 hectares.

10 MR. MARTEL: Oh yes.

11 DR. PAGE: I'm not surprised that it's
12 not economical to go back and get those. That is not
13 what is occurring here and it is not what would be
14 recommended in a plan if that kind of constraint --
15 impact of that constraint was evaluated using HSA. So
16 the impact on the timber supply could be evaluated and
17 forecast into time.

18 The whole purpose of this is to avoid
19 exactly the problem that you have identified, do not
20 leave small patches of poor quality timber behind
21 because it is not economical to go back and retrieve
22 it. Without evaluating what the impact of that
23 particular management scenario is on the timber supply,
24 you may make that error and not even realize it.

25 DR. THOMAS: Mr. Martel, to give one more

1 example, we've run into similar things like that where
2 the wildlife biologist was talking about a 50-hectare
3 block and the timber manager sat there and said:
4 That's not rational, let's leave a 200-acre block
5 because that's rational for us to come back and pick up
6 the next time around.

7 So what they did was make a joint
8 decision that satisfied both and considered exactly
9 what you're talking about in connection with the
10 long-term habitat supply.

11 MADAM CHAIR: One final question with
12 this type of proposed cutting plan, Dr. Page. This is
13 conceptually for wildlife habitat management. Would
14 you say a plan such as this would suit managing for
15 biodiversity?

16 DR. PAGE: Well, first of all, this is a
17 real plan, this is a real area and this is proposal for
18 that area. Because it's private, we don't know whether
19 this is the way it will turn out. It is more than a
20 concept.

21 To answer the question about biological
22 diversity, I actually am -- that has been my main area
23 of research, interest over the last year and a half,
24 and we've been looking increasingly intently at how
25 much we can achieve with these other methods that we

1 already have in place towards maintaining biological
2 diversity.

3 Right now there's no simple answer. The
4 answer to your question is, yes, this method of
5 managing for habitat for one species clearly will
6 benefit some other species. It's important to identify
7 which those are.

8 I was asked, invited to participate in
9 the ESSA workshops that the Ministry of Natural
10 Resources supported to address exactly that question
11 for the effects of timber management on other species
12 of wildlife, and I was back for I believe four
13 workshops to try and address those kind of questions.
14 Having --

15 MADAM CHAIR: I ask that question because
16 you have said that this cutting plan will permit the
17 harvesting of all old growth stands, and you've said
18 that's acceptable with respect to habitat supply
19 analysis.

20 DR. PAGE: For deer.

21 MADAM CHAIR: For deer. Well, with
22 respect to managing for biodiversity, we haven't heard
23 any evidence that would suggest you can harvest all old
24 growth stands and still manage for biodiversity.

25 DR. PAGE: For some species. One of the

1 species of concern in this area is marbled murrelets.
2 For that species already too much has been harvested.
3 It is similar ecologically to the spotted owl,
4 requires fairly large areas of unbroken habitat
5 apparently, and marbled murrelets no longer nest in
6 this area.

7 So from that standpoint, even the
8 constraint approach to retain all remaining old growth
9 is too late for that particular species. So from that
10 standpoint we have not maintained all biodiversity in
11 this particular area.

12 The biodiversity issue is more difficult
13 and the way that we are addressing it is similar to the
14 way the Coalition has proposed, is to retain areas that
15 are not harvested at all for a period of time and also
16 subsequently, though, to make sure that there is a
17 continuing supply of different ages of stands down the
18 road.

19 MADAM CHAIR: So in this particular
20 situation historical circumstance has played a large
21 part in defining both wildlife management and
22 management for biodiversity?

23 DR. PAGE: Yes. And the topic of whether
24 our understanding of biodiversity is sufficient has
25 been the efforts of one panel and could be the efforts

1 of many more.

2 MADAM CHAIR: Okay, thank you.

3 DR. THOMAS: Madam, one point that I
4 would make is the approach will work, you just have to
5 change the objective.

6 If biodiversity became the interest and
7 older age stands became the critical part of the view,
8 they would merely change their analysis with a
9 different objective, that objective being the
10 production and retention of older age stands with a
11 particular structure.

12 The principles he's showing you would
13 apply, but the objective would change.

14 MADAM CHAIR: And the resulting stand
15 composition would change?

16 DR. THOMAS: That's correct. And the
17 timber yield and the effect on other wildlife will
18 change. But he could do such -- you could do such an
19 analysis just this way.

20 DR. PAGE: And we are. This is the
21 results of the application of an HSA exclusively for
22 deer.

23 As I mentioned before, we have one also
24 exclusively for elk and the two do not end up in the
25 same plan. You can evaluate the two simultaneously.

1 We also are attempting to develop the impacts on
2 biological diversity and to incorporate those as well
3 in an HSA.

4 MR. MARTEL: Are we ready to move to that
5 step now, to take -- where we move from constraint to
6 habitat supply to biodiversity all in one leap?

7 Do we have the tools that allow us to do
8 that?

9 MR. PATCH: The tools are there to allow
10 you to assess that. What you need is to define the
11 objective of how much biodiversity you have.

12 DR. THOMAS: And how much it will cost.

13 MR PATCH: Yes.

14 DR. THOMAS: Those things -- these are
15 not decisions -- these don't make decisions.

16 MR. MARTEL: No, no, I understand.

17 DR. THOMAS: They analyse alternatives.
18 We are debating now, we've been through a very similar
19 analysis on spotted owls and now people in your
20 position are debating whether that's acceptable to the
21 American people economically, socially and otherwise,
22 and that's the way it should be.

23 The technical people provide the
24 analysis, the appointed or elected officials make
25 decisions. Somebody told me the other day, he said:

1 What should we do? And I said: I do analysis for what
2 you pay me. If you want me to make decisions, I want
3 your salary.

4 MR. MARTEL: Well, we've asked the
5 parties to try to come up with -- I mean, everybody
6 wants a chunk of northern Ontario, Dr. Thomas.

7 DR. THOMAS: Yes.

8 MR. MARTEL: And at this point I think my
9 colleague and I calculate roughly there's nothing left
10 when you give everybody what they want, or if you
11 attempt to, there ain't enough land there.

12 DR. THOMAS: You're now absolutely,
13 precisely, totally correct. We are in violent
14 agreement. That's what happens when you go to
15 constraint management and you start trying to solve the
16 problem on the land base by saying: You get this
17 chunk, I get that chunk, Dennis gets that chunk. If
18 you do that, you quickly run out.

19 Obviously, in order to supply jobs,
20 materials for the market with an expanding population,
21 expanding demands on our natural resources, we had to
22 move to some more sophisticated mechanism of getting
23 there. In some cases reservation at least temporarily
24 is appropriate, but if you just do it by division you
25 will very shortly come to exactly your conclusion,

1 there's not enough there.

2 If you can do this sort of analysis,
3 starting with what we have now and moving to more
4 sophisticated levels as information becomes available -
5 we call it a 'two for', 'two for one'. How do we
6 manage to get the outputs that we want across the
7 board? With intelligent manipulation of data,
8 information and understanding, both economic,
9 ecological and social.

10 MR. MARTEL: But how do you get agreement
11 amongst all the parties. I mean, part of the problem
12 is to try to get people to sit down and reach some form
13 of agreement.

14 We've sent our parties back twice to
15 negotiate for lengthy periods of time. Unfortunately,
16 we have agreement on a little bit.

17 DR. THOMAS: Yes.

18 MR. MARTEL: Consensus. Amongst all the
19 parties who are going to be out there fighting for the
20 same chunk of land that we're talking about, I said to
21 them a couple of weeks ago, with all the brain power
22 sitting around the table we couldn't reach those
23 agreements, going to have to impose everything.

24 DR. THOMAS: I can respond to that from
25 some personal experience. I wish I could tell you that

1 you will get an agreement, you will not.

2 MR. MARTEL: Thank you.

3 DR. THOMAS: The hired gladiators will
4 fight it out forever, gladiators get paid to wrestle in
5 the arena.

6 But basically, that formulates what's
7 the -- the extremes bound the decision, and it begins
8 to bring down an acceptable political, economic,
9 social, ecological decision space.

10 Okay. We have within that space the
11 ability to make decisions with which no one will agree,
12 at least publicly. Realistically and rationally
13 there's also the fact that people get very tired - and
14 I'm sure you're exhausted - people get very tired and
15 at the end that exhaustion leads to the ability to make
16 rational compromise. I hope that's what ends up.

17 But we've been through this in a lot less
18 civilized fashion than you're going through it. We
19 have not come to consensus, but we now know where the
20 decision space is, where the decisions are indeed
21 rational and possible.

22 For example, we know we cannot eliminate
23 all old growth, so we're going to -- that's not going
24 to happen, we're not going to do that. We're not going
25 to save all old growth. Once we have made that, the

1 decision space closes. That's just one example, you
2 could go to others.

3 We may be willing to take "x" amount of
4 economic sacrifice, investment in other things that the
5 public wants, but that has limits and one can identify
6 what those limits are and it defines the space within
7 which you can operate.

8 DR. PAGE: I would like to return to one
9 question you asked, Mr. Martel, which is: Can we go
10 from the status quo of the current situation to
11 managing for biodiversity and all other aspects in one
12 great leap, and the answer is clearly, no.

13 But also, the only way to get there is to
14 start the journey and take a single step. In our
15 particular case we took that step with black-tailed
16 deer, or moose, or some other species.

17 Once you understand, you elaborate, we're
18 getting much closer to the kinds of solutions that Dr.
19 Thomas had just mentioned that they were trying to
20 achieve in the United States where you define your
21 decision space, define what's successful and they're
22 not perfect.

23 And the end result, hopefully, of
24 incorporating many of these concerns that we've been
25 discussing is a timber harvest plan, as I just

1 mentioned, that does result in remaining habitat that
2 is suitable for the animal or the array of species of
3 concern.

4 In this particular case, the dark green
5 cross-hatched area and surrounding habitat are areas
6 that provide the majority of the winter habitat for
7 deer. If all those areas are removed - this is the
8 status quo - if all those areas are harvested and if
9 the second growth is inadequate, then presumably this
10 map would be entirely cross-hatched, your horizontal
11 lines in red here, inadequate habitat.

12 This is what we have today, and after
13 developing scenario 3, evaluating it, we anticipate
14 that 20 years later we would still have a habitat
15 structure that looked like this. The deer wintering
16 areas are now in different places, we haven't drawn a
17 line on a map and said: Deer habitat must be provided
18 within this geographically restricted area.

19 And that's exactly the same as in New
20 Brunswick. As Mr. Patch has identified, referring to
21 Exhibit 2103C, there are deer winter ranges identified
22 here in 1989, at some time in the future those areas
23 will fail -- begin to fail to produce deer habitat and
24 deer winter range will be defined in some other
25 component of the landscape.

1 But by using the HSA you can evaluate the
2 supply of habitat throughout that time frame so there
3 is no, what we would call, the timber supply analysis
4 fall out impact, there is no period where you run out
5 of supply.

6 MADAM CHAIR: Excuse me, Dr. Page.

7 DR. PAGE: Yes.

8 MADAM CHAIR: Visually it looks as though
9 in the 20-year forecast you have more severe winter
10 habitat for deer than you do today.

11 DR. PAGE: I'm going to show a summary
12 slide here next, Madam. Yes, there is, but there is a
13 difference.

14 Currently we have -- the green indicates
15 a large amount of old growth habitat providing deer
16 winter range. The orange area are what I termed here
17 the buffer habitats, those are the areas where neither
18 stand is suitable but this fairly narrow strip -
19 because these cut blocks are large relative to these
20 animals - very narrow strips that the animals can find
21 the requirements; in other words, the edge of the
22 stand, forested stand has food, the edge of the
23 clearcut may have some cover. This is this small
24 orange bar here.

25 If all of the old growth is removed in

1 scenario 1 with no consideration for future supply,
2 there is a substantial area remaining of these buffer
3 strips in the area, but these are probably not as
4 valuable to deer as a stand that contains all the
5 attributes.

6 In scenario 3 we reduced that buffer area
7 but what we have done here is produced this managed
8 habitat that we think is very much the same quality as
9 the old growth habitat which has been removed.

10 Scenario 2 is the cut no -- the constraint approach,
11 cut no deer habitat.

12 MADAM CHAIR: Excuse me, I think I
13 missed, I don't know what you're referring to by buffer
14 habitat type?

15 DR. PAGE: The areas just along the
16 edges, so if you return to this one. One of the ways
17 of referring to them is ring habitats. You can see an
18 area here, for example.

19 In this case there's a clearcut that's
20 relatively large surrounded by forested area and the
21 animals are able to use just that edge of that
22 particular habitat. As I mentioned, there are
23 differences in the edges of stands. There is more
24 light coming in under the forest canopy and there is
25 food there, whereas a central stand has no food.

1 So we know that deer occupy these areas,
2 similarly moose do, but these areas are not as
3 valuable, particularly when there is snow on the
4 ground, as areas such as these managed habitats where
5 the food isn't dispersed throughout the stand, it's
6 more uniformly available.

7 The other problem with these areas when
8 you now try to extrapolate to the population estimates,
9 is that the animals are extremely vulnerable to hunting
10 and predation in those areas. So even though the
11 habitat potentially can be provided for the animals you
12 are unlikely to find animals there because they still
13 are unable to survive.

14 But the next step of taking this habitat
15 supply and anticipating your population, we have no
16 doubt at all that these orange bars do not equal the
17 blue and the green bars there.

18 MADAM CHAIR: All right. So the orange
19 bars are some measurement of the edge effect that
20 you're getting from the harvest blocks?

21 DR. PAGE: That's right.

22 MADAM CHAIR: Okay.

23 DR. PAGE: And there is substantial edge
24 effect after any harvest.

25 MADAM CHAIR: All right.

1 DR. PAGE: Now, that was a lengthy
2 presentation as it turned out. Maybe before I sit down
3 I'll just ask, are there any more questions about the
4 overheads that you would like me to refer to now?

5 MADAM CHAIR: No, thank you very much.

6 DR. PAGE: So the very short summary
7 there is, that in this particular case, in the real
8 world, on private timber land, we believe that HSA has
9 allowed us to have the best of all worlds. We've been
10 able to maintain our timber supply and provide the
11 necessary habitat. We would not have been able to do
12 that successfully with the constraint approach that
13 previously existed.

14 MR. O'LEARY: Q. Thank you, Dr. Page.
15 If I could refer you to the report at page 17 of the
16 witness statement, Exhibit 2097, can I ask you whether
17 or not you had any involvement in the preparation of
18 that report?

19 DR. PAGE: A. You're referring to Tab
20 17?

21 Q. Yes.

22 A. Yes. Myself and my co-worker Mr.
23 McNay initiated the habitat assessment program and
24 developed the initiative, the inertia to increase the
25 initiative to the point that we were able to hire or

1 reallocate a staff position and we hired Mr. Eng, and
2 Mr. Eng and Mr. McNay are the senior authors on this
3 report, but myself and many other people contributed
4 sections to this.

5 Q. So you're familiar with it?

6 A. Yes.

7 Q. And the development?

8 A. Yes, and I authored much of it and
9 edited all of it.

10 Q. All right. If I could turn you to
11 page 1 of the report, the heading Problem Reference is
12 appearing and the subheading Planning for Intergrated
13 Management of Timber, Deer and Elk.

14 You indicate at the bottom of paragraph 1
15 that:

16 "There has been intensive research for
17 the past two decades in respect of
18 black-tailed deer."

19 And can I ask you whether or not that
20 research was necessary prior to the implementation of
21 HSA in British Columbia?

22 A. Actually just the converse. The
23 existence of the research program allowed us to rapidly
24 evaluate the effectiveness of the HSA, but was not
25 important in the development of the model.

1 We developed the model essentially in the
2 absence of the data with the use of expert opinion and
3 the knowledge and the data at hand.

4 Q. All right. Do you have any sort of
5 estimate of the cost of this research that you're
6 referring to?

7 A. The total cost incurred by the two
8 ministries involved amounted to about a hundred
9 thousand dollars a year, so roughly a million to
10 \$2-million, depending on the amount of effort that was
11 considered to be part of that project.

12 Q. Based on your answer just a moment
13 ago, should the costs associated, therefore, with this
14 research be in any way associated with the costs of
15 implementing the habitat supply analysis approach in
16 British Columbia?

17 A. No, and in cost estimates I have
18 always excluded those particular costs.

19 Q. All right. Are you familiar with the
20 moose habitat research program or initiative that the
21 Ministry of Natural Resources is proposing for Ontario?

22 A. Yes, I am.

23 Q. All right. Do you have a view as to
24 whether or not that research initiative would be
25 necessary before habitat supply analysis is used or

1 could be used in Ontario?

2 A. It's not at all necessary. The
3 approach -- the topic of the research is similar to
4 that of ours, which is largely process oriented
5 research to understand the animals' habitat needs
6 better, but it's neither a prerequisite for the
7 development of HSA.

8 Q. Can I ask you, given your experience
9 in British Columbia, whether or not these research
10 initiatives with respect to black-tailed deer, did they
11 have any impact on the resolution of conflicts between
12 timber management and wildlife habitat in terms of
13 uncertainty associated with the relationships?

14 A. Well, the conflict has substantially
15 changed. In our particular case, the research
16 program -- the initiation of the research program all
17 parties were involved, including the public. We have
18 had public representation on our committees throughout
19 the entire time frame.

20 By the time the issue was -- the research
21 was completed, the information that we had gained had
22 been disseminated to all of our user groups which
23 included the forest industry, public members and the
24 other agencies involved.

25 So consensus developed over the course of

1 the research. The issue has also changed, as Mr.
2 Martel has mentioned, to other topics such as
3 biodiversity and old growth, from a fairly simplistic
4 concern in 1980 of: Is there enough habitat for deer.

5 Q. All right. So in recognition of
6 that, can it be said in British Columbia that all of
7 the uncertainties associated with these relationships
8 have now been cleared up?

9 A. No, just the converse. Our belief in
10 our knowledge has increased, but the uncertainty of
11 predicting the future is still obviously similar.

12 Q. All right. And based upon your
13 experience in respect of the black-tailed deer research
14 projects and programs in British Columbia, do you have
15 an opinion as to what is the likely outcome of the
16 moose habitat research program that is proposed by the
17 MNR here in Ontario in respect of rectifying or ending
18 conflicts between timber management and wildlife
19 habitat in terms of uncertainty?

20 A. I don't believe the conflicts are due
21 to a lack of information, so I don't believe that the
22 collection of more information will resolve the
23 conflict.

24 Q. All right, thank you. Now, going
25 back to the --

1 MADAM CHAIR: One further question, Mr.
2 O'Leary.

3 MR. O'LEARY: Sorry.

4 MADAM CHAIR: Dr. Page, have you in your
5 research program learned of any effect between
6 providing wildlife habitat and the size of populations
7 in British Columbia, specifically with respect to
8 black-tailed deer?

9 DR. PAGE: The size of the deer
10 population you're referring to?

11 MADAM CHAIR: Mm-hmm. Do you have any
12 evidence that providing wildlife habitat through the
13 HSA approach is increasing or maintaining deer
14 populations?

15 DR. PAGE: Yes, within the local areas,
16 and this is an example where the method has been
17 applied, there are undoubtedly more deer than in
18 adjacent areas that were harvested with timber only
19 objectives, where the majority of the deer habitat has
20 been removed.

21 Those areas largely contain no deer now,
22 not just because of the lack of habitat but, as I
23 mentioned in the case of those buffer areas, because
24 other factors such as increased access by hunters and
25 increased vulnerability to predation have eliminated

1 the residual deer populations.

2 MADAM CHAIR: I don't think I phrased my
3 question properly.

4 You take it as common knowledge that
5 where there is habitat deer are more likely to exist,
6 but in the research you've done in British Columbia in
7 the last 12 years, has enough time passed that you can
8 prove that the wildlife habitat that has been set aside
9 under the HSA approach has, in fact, attracted
10 wildlife, has led -- has had some effect on the size of
11 deer populations?

12 DR. PAGE: I suppose I wasn't clear in my
13 answer as well. That the way we evaluated that
14 question of what has happened to the habitat over time
15 is by looking at, in our particular case, nine
16 different watersheds, roughly half of which the HSA
17 method was not applied. The timber was harvested, no
18 concern for deer habitat, and the deer populations are
19 eliminated from those areas.

20 Where we have implemented HSA and
21 modified the harvest plans, the deer populations are
22 still viable. I believe the answer to your question
23 is, yes, HSA has maintained the deer populations where
24 they otherwise would not have been maintained.

25 MR. MARTEL: The evidence we have here is

1 that the moose population under the existing system is
2 going up. Now, a part of that of course is through
3 regulations of hunting and the tagging system and so
4 on, but I think the Ministry's position is that the
5 number of moose has significantly increased over the
6 past 10 years, and I think they want to get by the year
7 2000 - I forget what the figure is - but I think it's
8 double almost what they anticipated or calculated we
9 had at the time they introduced their program.

10 MR. O'LEARY: Q. Dr. Thomas, might I
11 invite you to comment in respect of Mr. Martel's
12 question about reliability.

13 DR. THOMAS: A. I don't want to pretend
14 to know anything about moose because I have not worked
15 on moose, but when we have these similar discussions
16 somebody always brings up the story about the fellow
17 that's washing windows on the 12th floor of the Empire
18 State Building and here's a fellow coming down rather
19 rapidly, free fall, and he yells at him and says: Hi,
20 fellow, how's it going? And the guy says: So far so
21 good.

22 Now, there's a moral to that story.
23 Where you are right now does not necessarily predict
24 where you're going to be in the future. In fact, if
25 you look at ungulate populations around the world, the

1 most dramatic crashes in ungulate populations that have
2 ever been recorded follow all-time highs.

3 So if you had evaluated the program the
4 year before the crash you would have said: Hey, we
5 must be doing something right here, and the next year
6 you would have evaluated it and said: My gosh, we must
7 have been doing something wrong here.

8 Well, what habitat supply analysis does
9 is supply the base under that population that one can
10 predict and say whatever it is we're doing right, and
11 we know what it is, if we continue to do that we would
12 anticipate so and so.

13 Now, keep in mind there's a real
14 difference between habitat by itself and the other
15 aspects of the art of wildlife management, which is the
16 manipulation of the population. I'm sure moose, like
17 most ungulates, can be their own worst enemy if they
18 grow unconstrained.

19 So there's two sides to that. The
20 habitat is the base underlying foundation, and then
21 there's manipulation of other factors above that, but
22 one cannot have the moose without the habitat.

23 So the point that I'm trying to make, to
24 sum up, is that there -- if one deals with the
25 ungulates and is totally fascinated by numbers of

1 animals you are apt to be in deep trouble some time
2 within the period because those populations will
3 fluctuate above the population base. So many times,
4 and dealing with elk for example, our management
5 objectives are really what we will allow to happen; in
6 other words, we have 20,000 elk, we know from
7 experience that 30,000 elk cause a lot of damage and
8 get -- winter range is not adequate, they get out in
9 the farmers' haystacks, et cetera. So there's a
10 limitation there, which is a social limitation.

11 But be careful that one does not,
12 particularly with ungulates, become dramatically
13 fascinated totally with population numbers because, as
14 I said, remember that the animals are always at a peak
15 before they go to a low, and that usually will occur
16 within a very short period of time if they exceed
17 habitat support.

18 MADAM CHAIR: And so are you saying, Dr.
19 Thomas, in the planning that you do you wouldn't, for
20 example, set as an objective a certain size of wildlife
21 population?

22 DR. THOMAS: Yes, we set a target
23 population keeping in mind, however, that it is -- at
24 least with elk, it is pure fantasy if I came in and
25 told you as my commissioner, or my chief, that we're

1 going to grow 25,000 elk. Our target is 25,000, our
2 inability to be absolutely precise would say: We're
3 going to hold this population between 15 and 25,000.
4 On the other hand, that seems very inprecise.

5 On the other hand, if you go from zero to
6 a million, it's rather a precise definition. So we
7 say, yes, we have a population target but we do not
8 assume absolute predictability between the two.

9 That's the adaptive management mechanism:
10 Are the numbers of animals causing habitat damage. If
11 they are, you go back to the adaptive management and
12 you reduce the population or you shoot for some longer
13 term revision in your habitat conditions. Those are
14 feedback loops.

15 But basically when we come to habitat
16 evaluation it's usually based on some other aspect such
17 as amount of area utilized by the animals, where we
18 want 85 per cent of the area to be within useful
19 habitat condition for elk or 55 or 60 per cent.
20 Through experience we have some idea of what population
21 that will produce. However, there are limits on all
22 sides. Once the population goes too high you may have
23 problems with regeneration. They may tromp or trample
24 or eat your seedlings or cause other problems.

25 So there's always a constant adjustment

1 between two things, one is habitat and the other is the
2 population and what affects that population. They're
3 all part of the same thing but indeed separate and
4 analysed separately.

5 MADAM CHAIR: Go ahead, Mr. O'Leary.

6 DR. PAGE: And if I could please respond
7 to Mr. Martel. I am a moose expert and I know that the
8 Ministry has determined that the current increase in
9 moose population is due to a reduction of the kill by
10 hunting and is unrelated to habitat, indicating that
11 exactly the problem Dr. Thomas has identified could be
12 occurring in Ontario.

13 You have identified one factor and
14 modified it, but if the habitat supply is about to
15 decrease then that population, despite its current
16 increase, may be on the verge of a collapse.

17 MR. O'LEARY: Q. Mr. Patch, I don't want
18 to leave you out of the discussion. I wonder if I
19 could take you back to Exhibit 2102 and your discussion
20 yesterday about an example in New Brunswick at page 4
21 of your overhead projection, and I believe that refers
22 to deer wintering area - and we're not talking about
23 moose - but in the absence of New Brunswick using or
24 putting into effect a habitat supply analysis, if we
25 were to look at the five-year portion on that scale,

1 can you tell me, what would the view have been in
2 respect of the population of deer at that point, what
3 would their opinion have been as to the levels if you
4 had not employed the habitat supply analysis models?

5 MR PATCH: A. Well, I would start and
6 I'll take it back a little further. As Dr. Thomas has
7 referred to, ideally you want to target population, and
8 if you have an understanding about how much habitat is
9 required to support that population, then you set a
10 habitat objective but recognize that there are other
11 things besides habitat supply that may influence your
12 population at any one time.

13 But you know that if you don't have
14 habitat that is essential for a particular species, you
15 won't be able to maintain that -- you won't be able to
16 maintain the target population that would be
17 guaranteed.

18 Now, in our situation with looking at
19 habitat supply of deer wintering areas, given the
20 characteristics of the stands in our deer wintering
21 areas, we could apply guidelines on how much area
22 should be cut, that you only want to cut 30 per cent at
23 one time and the rest of the forest that you leave has
24 to be in a certain condition of proportion of softwood
25 trees, with a certain canopy closure and above a

1 certain height. That's similar in principle to what
2 might be talked about requirements for moose habitat.

3 But the problem is that those particular
4 areas that we were leaving through application of
5 guidelines would not be providing habitat at some time
6 in the future because the dynamics, the characteristics
7 of those stands would change. And the problem is that
8 we could look through time and see: Well, we can apply
9 guidelines and in the short term they are providing
10 good habitat, we anticipate that that could have a
11 positive impact. But if we don't have an overall
12 habitat objective and test to see whether through time,
13 through application of those guidelines, we reach that
14 habitat objective, that at some point those stands that
15 you left or something changed it would no longer
16 provide the habitat that you intended to manage for.

17 And I guess that's a New Brunswick
18 lesson, given the dynamics of our stands, to clearly
19 show that we could have constraint management in terms
20 of guidelines but that would not lead to successfully
21 providing deer winter habitat through the future.

22 We had to look at broadening areas and
23 managing for age-classes of stands and forecasting
24 those stands that were not currently habitat, could
25 they provide habitat in the future in different or

1 adjacent areas and look at the areas that are currently
2 providing habitat that you're providing and see how
3 long they will be suitable.

4 And in our forecasts one could see that
5 there's a good supply of habitat one can infer, yes,
6 the population levels are there, we looked then within
7 a 10, 15-year period our habitat supply was collapsing.
8 And the in the absence of predictive tools, one
9 risks -- one runs a high risk of assuming that because
10 population levels are adequate or that they're
11 increasing today that they will, in terms of population
12 levels, be maintained today for whatever your target
13 is.

14 Q. Mr. Patch, is the habitat collapse as
15 you indicated is a potential risk, can you tell me what
16 steps can be taken at that time to rectify or remedy
17 the situation and how difficult it would be to do that?

18 A. Well, one can look at their different
19 silvicultural options that one might use to apply in
20 the areas to produce that production objective of so
21 much habitat, or one has to turn to other areas that
22 have right conditions that will produce habitat in the
23 future.

24 The options are to look not just
25 focussing on what's there today, but look at how that

1 is going to change: Are there ways you can modify its
2 change, are there ways that you can speed up the
3 development through silviculture of adjacent stand
4 areas so that you can provide good habitat in the
5 future because you know what's there today will not be
6 there tomorrow.

7 I think the B.C. example is just like
8 that. They have a production example, production
9 objective of deer and looking at the old growth habitat
10 for black-tailed deer - Dr. Page can correct me if I'm
11 wrong - what they're doing is looking at second growth
12 stands, so I assume they've been intervened or
13 harvested before and, in their development, applying
14 silviculture so that they change those stands, they go
15 in and open them up so that structurally they have the
16 right characteristics so that they mimic old growth,
17 but they aren't old growth, but they provide the
18 structural characteristics through silviculture that
19 old growth provides to provide deer winter shelter.

20 As far as what do you do after the
21 habitat collapses, that's what you do today if you
22 forecast a problem in the future. If you reach the
23 point for which you don't have habitat supply and, in
24 the case of our deer wintering areas it takes you 50
25 years to grow a stand to provide the right

1 characteristics, there's very little you can do, your
2 options are foreclosed. So if you wait to the point
3 that the disaster happens, you're sunk.

4 If you -- I guess what I was talking
5 about is if you can predict it today that you have a
6 problem, there are certain options you can take to
7 address the problem that you know is going to appear 40
8 years down the road.

9 DR. PAGE: A. Rather than correcting Mr.
10 Patch, I agree completely that habitat is not something
11 that can be preserved, it must be managed for.

12 Q. Dr. Page, going back to the report
13 under Tab 17 in the witness statement, you state at the
14 bottom that:

15 "The planning for habitat management not
16 only requires a change in focus from the
17 stand to a larger planning unit, but also
18 knowledge of other habitat specifications
19 that are perhaps not explicit to
20 management problems."

21 Can you explain to us what you mean by
22 that statement?

23 A. Well, there's a few components to
24 that. I think we have identified a number of times the
25 necessity to look at the scales that are both above and

1 below the one that you're dealing with. So if you're
2 managing -- manipulating stands, you must understand
3 where those stands are in relationship to other stands,
4 and that's in terms of the scale component.

5 Q. At the top of page 3 of that report
6 it states that, the very first sentence:

7 "The Ministry of Environment is in a less
8 desirable reactive position. The
9 process stipulates a short-term planning
10 framework, usually with a five-year
11 planning horizon, and forces wildlife
12 managers to focus on a stand by stand
13 scale."

14 Is this situation any different from that
15 faced by wildlife biologists in Ontario applying the
16 moose habitat guidelines?

17 A. It's essentially identical. The
18 short planning horizon forces you to compare the value
19 of an area as an older growth stand or an older stand
20 to a clearcut in that five-year planning horizon.

21 I think clearly that is not the same as
22 considering the longer term impacts when that stand
23 becomes older deer and becomes second growth.

24 Q. In the second paragraph on page 3 you
25 make reference to an interdisciplinary team approach to

1 planning. Are you familiar with the planning team
2 concept as presently employed in Ontario?

3 A. Yes, I am.

4 Q. All right. Given that
5 interdisciplinary teams are commonly employed in
6 Ontario, does this in any way reduce the need for a HAP
7 tool of the sort that you have described in your
8 presentation and evidence so far?

9 A. Our example has been just the
10 opposite, that the use of the tool helps define the
11 common grounds. Dr. Thomas has mentioned this as well,
12 that when the foresters understand some of the
13 biological consequences of their actions, and the
14 converse the biologists understand the consequences of
15 forestry, and the public is involved throughout that
16 process, there is a much better understanding of the
17 overall issues. It doesn't necessarily mean that
18 there's a single concensual solution that everyone
19 agrees, but we're getting closer towards that.

20 MR. O'LEARY: I see it's twelve o'clock,
21 Madam Chair.

22 MADAM CHAIR: Yes, Mr. O'Leary, it's
23 lunch time. Before we break for lunch we want to know
24 how much longer you are going to be in
25 examination-in-chief with your witnesses and then we

1 want to ask counsel how long they will be in
2 cross-examination.

3 MR. O'LEARY: It's a little difficult to
4 estimate because there is a lot of discussion that is a
5 little hard to anticipate.

6 I'm hoping that it's helpful to the
7 parties and the Board, we are making best efforts and
8 we will continue to try and reduce the amount that I'll
9 ask because a lot of, I think, is going to come out in
10 the discussion process.

11 I had hoped that we would be able to make
12 it through and complete everything today, and if we
13 were so inclined, perhaps if that meant sitting a
14 little later, but I think we have taken a little longer
15 this morning than I had anticipated getting through the
16 evidence of Dr. Page and Dr. Thomas is going to be up
17 relatively soon, and my sense is, in talking with the
18 other parties, that there isn't a large line up in
19 terms of the cross-examination, unless that's changed.

20 It sounded like the cross-examinations
21 would last no more than perhaps a little bit better
22 than a day, and I'm certainly open to suggestions, but
23 with your permission, it might be necessary for us to
24 take a bit of tomorrow morning.

25 MADAM CHAIR: Mr. Cassidy, how long will

1 you be in cross-examination.

2 MR. CASSIDY: Well, barring the
3 unexpected I anticipate an hour or less. I have spoken
4 to Mr. Lindgren and he has told me roughly the same
5 time frame for himself.

6 MADAM CHAIR: Okay. Ms. Gillespie?

7 MS. GILLESPIE: We are not
8 cross-examining this panel, Madam Chair.

9 MADAM CHAIR: Thank you. Mr. Freidin?

10 MR. FREIDIN: A day.

11 MADAM CHAIR: Well, we're scheduled to
12 conclude on Thursday. That sounds like we will be able
13 to accommodate that, without too much trouble. So I
14 don't see -- unless things are very slow this
15 afternoon, I expect that we could finish Dr. Thomas'
16 examination-in-chief tomorrow morning.

17 MR. O'LEARY: I would think so, yes.

18 MADAM CHAIR: Thank you. We will be back
19 at 1:30.

20 ---Luncheon recess at 12:05 p.m.

21 ---On resuming at 1:30 p.m.

22 MADAM CHAIR: Please be seated.

23 Mr. O'Leary.

24 MR. O'LEARY: Thank you, Madam Chair.

25 Q. Dr. Page, just before lunch there was

1 a discussion which followed another question put to you
2 by Mr. Martel and it was generally in relation to the
3 practicality of planning for a number of objectives and
4 proceeding with those initially, and you indicated that
5 it was clearly not possible to do it all at once in the
6 first step.

7 And I was wondering if you could perhaps
8 elaborate a little more on what you mean by this?

9 DR. PAGE: A. By doing it all, I thought
10 perhaps Mr. Martel was referring to me all the public
11 objectives for all resources on all the forest land,
12 and what I would recommend as a first step is exactly
13 the kind of proposal that the Coalition has addressed
14 here, that for a number of individual species HSAs can
15 be developed and their proposal, such as they have
16 developed for managing for biodiversity, is an
17 appropriate and effective first step in trying to meet
18 the desires of the public from the forested land use.

19 MR. MARTEL: Did I hear you say a number
20 of species and be developed in conjunction with the
21 biodiversity, or did I mishear?

22 DR. PAGE: In conjunction with, I just
23 mean at the same time.

24 MR. MARTEL: Mm-hmm.

25 DR. PAGE: Not necessarily by the same

1 individuals, but the processes are a good place to
2 start, those models.

3 MR. O'LEARY: Q. All right. Dr. Thomas,
4 I wonder if I could turn to you for a few questions,
5 and the first one I would like to ask you is: Now that
6 you have heard the evidence of both Mr. Patch and Dr.
7 Page, I was wondering if you had any comments in
8 respect of what they said and perhaps in relation to
9 your experiences in the United States?

10 DR. THOMAS: A. We use some very similar
11 type approaches, there's little differences, but the
12 underlying philosophy, the underlying techniques are
13 the same.

14 We probably have -- by U.S. law we are
15 required to do forest planning for all of our national
16 forests which are encompassed in the United States, so
17 we've moved across a broad spectrum of habitat types of
18 forest conditions to do this, and it's in action.

19 I don't have anything to say beyond the
20 fact that we're doing very similar things, probably a
21 whole lot more different kinds of things because of the
22 geographic scope all the way from Florida to California
23 and from New Mexico and Arizona north to the Canadian
24 border, but in most cases we use essentially the same
25 approaches and techniques.

1 Q. Okay, thank you. And if I can ask
2 you then to turn to page 8 of the witness statement,
3 you indicate in response to question 11, the second
4 paragraph, that:

5 "All forests are wildlife habitat,
6 although the nature of the forest
7 structure affects the type and quantity
8 of species that will be produced at any
9 point in time."

10 What do you mean, Dr. Thomas, by the
11 nature of the forest structure?

12 A. If you recall the graph that Mr.
13 Patch had up going from the clearcut regenerating area
14 to an overmature forest stand, each one of those stages
15 has a different structure, each one of those structures
16 support wildlife in what's called a niche; in other
17 words, all the attributes that support that different
18 species.

19 If you look at it in an overall species
20 richness aspect, we see more species associated with
21 early succession, the very earliest successional stages
22 and the very latest, they go to a minimum level in the
23 intermediate stages, but essentially those are the
24 structures.

25 For example, that's what one talks about

1 rather than age, for - again back to the spotted owl
2 example - they find their primary habitat in old
3 growth, but it's not because it's old growth per se
4 it's because of the structure of the forest. In some
5 cases we have inadvertently produced structures that
6 are supportive of spotted owls in younger stands.

7 So it's a matter of the animal responding
8 to the structure of the forest, but that structure not
9 only is in terms of being in a vertical sense but how
10 it's arranged in a structure on the landscape, how the
11 different stands fit together in the different
12 successions or stages.

13 Q. Thank you. Can I ask you whether or
14 not you have a view as to whether timber management
15 activities can have an impact on the forest structure?

16 A. Every single timber management
17 activity, whether it's cutting, planting, thinning,
18 road construction, hauling, fertilization, every single
19 activity is, by default, a wildlife management
20 activity.

21 Every one of those mechanisms produces a
22 more or less predictable result in terms of the change
23 in the forest, its rate of growth, its structure, its
24 juxtaposition. Therein lies the key to us being able
25 to coordinate forest management and wildlife

1 management.

2 In essence, if I had a forest to manage
3 as a wildlife biologist and my board gave me directions
4 of what my objectives were, I would use exactly the
5 same tools of forest management to achieve my wildlife
6 objectives. I might use them differently in order to
7 satisfy that objective, but the tools would be
8 precisely the same.

9 Q. All right. In the very next sentence
10 of the second paragraph in your response to question 11
11 you state that:

12 "It is impossible to undertake timber
13 management activities on a land base
14 without impacting wildlife."

15 I know you've touched on that already.
16 Is there anything else you would like to add or
17 elaborate on in respect of that response?

18 A. No, essentially two ways to view it.
19 One could look at it as, every action affects wildlife.
20 One can assume all those effects are negative. They're
21 only positive or negative related to the objective that
22 one has in mind, but every change will have an
23 influence on the wildlife communities.

24 If you are forecasting or able to think
25 through what you believe will happen, you can either

1 minimize impact or you can maximize benefit, depending
2 on how you do it, but that's the ability to anticipate
3 reaction and to control it for joint products which, in
4 this case, would be wildlife and forest products.

5 Q. All right, thank you. As I
6 understand matters, the Ministry of Natural Resources
7 has proposed that non-timber values be addressed
8 through an area of concern planning process whereby
9 significant wildlife areas are treated through
10 site-specific timber management prescriptions.

11 Now, if this proposal was made in the
12 United States, I would like to know what your view is
13 in respect of whether that process would adequately
14 address wildlife concerns associated with the timber
15 management activities?

16 A. Not totally, but there seems -- in
17 listening and reading there seems to be some confusion
18 that that is an invalid approach. It's not an invalid
19 approach, it's a technique.

20 Where the confusion lies is not in the
21 application of such techniques, but why such techniques
22 are employed. The difference between the area of
23 concern approach as a total approach versus a HSA
24 approach is in fact that it is an objective, one aims
25 toward the achievement of an objective.

1 There seems to be some confusion in my
2 mind in listening. If someone says: Well, why is that
3 not a constraint? There is a difference between a
4 constraint being the objective and a constraint being
5 applied to achieve an objective. If the constraint is
6 the objective, it's a constraint approach; if a
7 constraint is part of the mechanism to achieve an
8 objective, it's a technique or a tactic to get there.

9 For example, I will illustrate that by
10 saying, if we are interested in older age forest,
11 usually the only way to start is with the reservation
12 of some areas of older forest. However, HSA analysis
13 would tell you that that can't be the permanent
14 solution because that reservation would ultimately
15 fail. So reservation or an area of concern type
16 approach, a reservation of old growth and you say
17 that's it and that fixes the problem, it does not, it's
18 an approach to the problem, but with forecasting one
19 can tell how long would that last, what do we have to
20 anticipate in the future to replace it.

21 So I don't see one as being a replacement
22 for the other. But the area of concern becomes a
23 technique to a larger achievement of stated objectives,
24 it's just one of a bag of tricks. I mean that in a
25 positive sense, or bag of techniques.

1 Q. Turning now to your response to
2 question 12, and on page 9 you make reference to a
3 paper entitled Wildlife in Managed Forests, A Matter of
4 Commitment, and I believe that has been marked already
5 as an exhibit in this hearing as Exhibit No. 1975.

6 MR. O'LEARY: Madam Chair, Mr. Martel, I
7 was wondering if the copy was available for you.

8 MADAM CHAIR: Yes, we do have a copy.

9 DR. THOMAS: What's the tab?

10 MR. O'LEARY: Q. Looking at the first
11 page, which is 383, the bottom paragraph on the
12 lefthand side, you state in the last sentence:

13 "The technical capability to actually
14 practice multiple use forestry exists,
15 all that is lacking is the willingness
16 and ability to commit the necessary
17 resources and to bear the necessary
18 direct and opportunity costs."

19 Can I ask you what you mean by technical
20 capability in the context of that sentence?

21 DR. THOMAS: A. Technical capability
22 means that we have the tools available to us to achieve
23 that objective if it's given to us.

24 For example, in the United States, in the
25 management of national forests, we are required to

1 practice multiple use forestry. There is a difference,
2 however, between its initial philosophical requirement
3 and what we have evolved into today.

4 It's my opinion that in the beginning it
5 was -- we assumed that all good things would flow from
6 what we called good forestry, good forestry is good
7 wildlife management, and we found that that is not, in
8 the words of Gershwin, 'that's not necessarily so'.

9 Good wildlife management and good
10 forestry can be the same thing, assuming that we have
11 joint production and clearly stated objectives for
12 both.

13 We have the tools to do that. The
14 technical tools in forest manipulation, for example,
15 have been available in silviculture and forestry for
16 generations. The analytical tools that lend us to be
17 able to forecast timber supply, have existed for years.
18 This is merely an addendum to being able to use that
19 same information and those same techniques in a process
20 of being able to forecast impact on wildlife and to be
21 able to coordinate those objective functions.

22 In short, if we want to maintain deer
23 populations in a certain area in a managed forest, we
24 make that a joint objective and then we manipulate
25 those tools and analytical techniques that already

1 exist in order to give us forecasting capability.

2 Q. My next question I'll put to you
3 first, Dr. Thomas, but either Dr. Page or Mr. Patch
4 might also also want to respond; and, that is, do you
5 have a view as to whether or not it's likely that the
6 technical capability exists to implement HSA in
7 Ontario, given your experiences in other jurisdictions?

8 Dr. Page, I'll start with you.

9 A. Go ahead, you've had experience here.

10 DR. PAGE: A. One of the first times
11 I've returned to Ontario in recent years in a technical
12 capacity was to Timmins to speak to the technology
13 development unit there, almost three years ago now, on
14 exactly the subject of HSA and our experiences in
15 British Columbia at that time when our program was in
16 it infancy as well.

17 The Ministry's from that area had also
18 visited our sites in British Columbia and, to the best
19 of my understanding, the development of these models
20 has continued from that time to today in that region at
21 least and in the district, in Timmins as well.

22 The linking of these kinds of models with
23 GIS I think is already underway in Ontario.

24 MR PATCH: A. I would just add that in
25 my earlier evidence I talked about certain requirements

1 which included an inventory of what is out there in the
2 forest in terms of forest stands, where they are.

3 And, secondly, some kind of analytical
4 tools, predictive capability to look how those stands
5 within the forest might grow or change over time.

6 And, thirdly, some understanding of what
7 wildlife needs are in terms of those stand types and in
8 terms of what those stand types will look like in the
9 future. In areas where there are forest resource
10 inventory maps, in areas where those are available,
11 yes, that prerequisite is met.

12 The forest growth intervention type
13 models that look at harvesting and silviculture, those
14 are available and, yes, there is information to tell us
15 about what types of habitat different wildlife species
16 need. So the tools do exist.

17 DR. THOMAS: A. The U.S. experience has
18 been the same. For example, I went up some years -
19 I've forgotten how many years ago - to visit with Mr.
20 Patch and his associates, told them what we were doing.
21 They've taken that far beyond what we told them, others
22 have done the same thing.

23 But the capability -- the point being is,
24 that people have wanted to put this to work, have been
25 able to use the information at their disposal to begin

1 to move forward. It does not have to await the
2 ultimate levels of information that we would desire,
3 but in every case that I've known where we had a good
4 forestry operation and, as near as I know from
5 reputation, Ontario has a very good one, that there is
6 information at their disposal that they could use to
7 begin to move forward.

8 Q. Thank you. Moving, Dr. Thomas, over
9 to the righthand portion of page 383, the first
10 paragraph under the heading Multiple Use Forestry
11 Essential, you list three tests that forest management
12 must pass.

13 The first is the maintenance of wildlife
14 diversity, second is production of selected species of
15 wildlife from managed forests, and the third is -- you
16 state that:

17 "Not far behind will be the appearance of
18 the landscape that emerges as the forest
19 reaches a fully regulated state."

20 Can I ask you, have you reviewed the
21 terms and conditions of the Coalition which are marked
22 as Exhibit 1637?

23 A. I have.

24 Q. All right. And do you have an
25 opinion as to whether these tests which you have

1 identified at page 383 of Exhibit 1975 would be met if
2 the terms and conditions of the Coalition were put into
3 effect?

4 A. They appear to me to be sensitive to
5 those three needs. There may be other ways, but I
6 think that one would certainly accomplish it.

7 Q. All right, thank you. Then moving
8 over to page 384 of your paper, in the first paragraph
9 on the lefthand side you speak about objectives and
10 constraints and say:

11 "There is a subtle but absolutely
12 critical difference in the management
13 viewpoint between being a desired product
14 and a constraint."

15 During the evidence of Panel 4 there was
16 an expression by the Board about the difference between
17 constraints and objectives, and I know you've discussed
18 this briefly.

19 In light of your comment there, is there
20 anything else you would like to add in respect to the
21 difference between those two?

22 A. I think what I would like to explain
23 there is how that philosophy works in actual management
24 practice. For example, when we gave our forest
25 managers hard targets to produce in terms of wood

1 products and then told them that, after all, this is
2 indeed a multiple use outfit and we've got wildlife and
3 these other things, the manager treated those people
4 far differently and their input far differently and the
5 requirements far differently than they do now when they
6 have objectives that are multiple.

7 In the first case there was, under
8 pressure, the temptation to view those requirements as
9 saying: This is getting in the way of me meeting the
10 prime objective, the one on which I will be rated, the
11 one on which scores are kept. Now that the score card
12 includes other things as well and they're multiple in
13 nature, there's a real difference in the entire
14 attitude of the organization toward the achievement of
15 those joint products.

16 That attitude can be absolutely
17 everything in terms of getting to where you want to go
18 if you do have multiple objectives. So that was what I
19 talked about, a subtle but critical difference in
20 management philosophy, and it's taken us some time to
21 escape that.

22 For example, I wrote another paper one
23 time where I said it's very painful to be a wildlife
24 biologist and everything you deal with is a constraint
25 on the prime objective. After a while it begins to

1 wear on your nervous system: How would you like to be
2 a constraint. It's sort of looking like, you know, the
3 redheaded kid at the picnic, it can be a bad news
4 situation.

5 So you can really turn -- you can turn
6 the thing around very quickly when you have multiple
7 objectives and a common database and a common mechanism
8 of achieving those objectives, rather than being
9 constantly identified as: Here comes the constraint.

10 Q. Moving down that side of the page,
11 Dr. Thomas, to the third paragraph, you state in the
12 third sentence that:

13 "There must be clearly stated goals and
14 objectives both short term and long term
15 for the simultaneous production of wood
16 and wildlife."

17 What do you mean by long term in this
18 context?

19 A. We use a term in the United States
20 that's come into fashion within the last three years as
21 we're going back in our second loop on planning which
22 is what we call desired future condition. That's a
23 real shift in a long-term objective.

24 The objective in the short one was to
25 meet the timber targets, to meet the constraints and we

1 kept score that way. Habitat analysis and other
2 long-term forecasting leads us to believe we're going
3 in a direction, if we continue to do that, without some
4 long-term agreed upon view of the public of where we're
5 going, that we will fall short because they won't like
6 what's happening. In fact, it's been clearly stated
7 that they don't like what's happening in terms of
8 aesthetics, in terms of what the public concerns
9 inadequate attention to other variables.

10 Now, you've got to understand in the
11 United States we have an underlying law that requires
12 us, in the Forest Service for example, to maintain all
13 species well distributed within our planning areas and,
14 secondly, we have the Endangered Species Act that says
15 it's not a nice thing to put a species in danger of
16 extinction.

17 So given those two things, those are the
18 underlying objectives as we move forward. So we have
19 to have this future desired condition. So we're
20 probably -- most of our planning outlooks, we're
21 planning one rotation ahead. If we're dealing with an
22 80-year rotation, that view runs out at least 80 years.

23 However, the thing to say is. So it's
24 not confusing, is that you look out 80 years but if we
25 know one thing from human experience is things don't

1 work the way we think they ought to all of the time and
2 after 10 years we do a new plan and I'm fairly certain
3 in nearly all cases the new 10-year plan will be
4 different from the old one.

5 Knowledge will have increased, our
6 experience will have increased and the public may have
7 altered its view of the objectives it desires from
8 public lands. So we're scheduled to renew our planning
9 on a 10-year basis, however, we're looking at it -- in
10 reality we're having to adjust our plans much more
11 rapidly than that.

12 Q. You have now entered into the area of
13 my next question and, that is, given the degree of
14 natural variability in forest ecosystems and the
15 uncertainties which we've heard about, can I ask you,
16 what is the reasonableness of planning over such a
17 long-term horizon, why is it reasonable?

18 A. It's reasonable in the sense that if
19 you have no long-term objective, which in forestry the
20 only short-term objectives one can accomplish is the
21 meeting of saying we are going to cut "x" amount of
22 acres this year, we're going to thin "x" amount of
23 acres, we will constraint "x" amount of entry, that's
24 short term, but you do that only with a long-term
25 vision.

1 Foresters are probably the people in
2 society that began to get society to think in a longer
3 term because a forester knows from the time he plants a
4 seedling until he harvests a sawlog that it's very
5 likely he could begin his career with the planting of a
6 seedling and his son can end his 40-year career with
7 the harvesting of a log. So we have to have a
8 longer-term vision.

9 If you can visualize going from a
10 seedling to a tree as an objective, you can visualize
11 going from a seedling to a forest, and the forest is a
12 lot more than just a sawlog.

13 MR. MARTEL: But when doing that, Dr.
14 Thomas, can you actually -- because you say you have a
15 new plan every 10 years, if you set about as part of
16 the planning period one rotation and, say,
17 categorically this is where the road is going to be
18 seven years from now, this is the number of, let's say,
19 tourist operations which are going to be in existence
20 40 years from now, outside of having - and I think what
21 you say - long-term vision of what you want, to try to
22 cast those in stone in terms and conditions one would
23 expect to get out of a hearing such as this, is that
24 possible?

25 DR. THOMAS: No, and it's not desirable

1 either. In fact, it would be insanity to cast it in
2 stone. One must adjust to reality, changing public
3 taste, market demands, things that we learn along the
4 way, but still that does not preclude one from having a
5 long-term vision, but if you cast that vision in stone
6 I promise you that in - you know, assuming the
7 governments of our nations survive - that in 30 years
8 another board will sit here with a whole new cast of
9 characters talking about: How do we adjust at this
10 point.

11 But still we will have started out with a
12 vision, we will have started out with a road map that
13 can be adjusted as we go along and should be adjusted
14 as we go along, must be adjusted as we go along.

15 MR. O'LEARY: Q. Moving on now, Dr.
16 Thomas, to page 385, in the second full paragraph on
17 the righthand side of the page, looking at the
18 quotation of yourself from 1979 in the middle, you
19 state:

20 "To say we don't know enough is to take
21 refuge behind a half truth and ignore the
22 fact that decisions will be made
23 regardless of the amount of information
24 available."

25 You've heard a discussion today about the

1 proposed moose research initiative that the MNR is
2 considering in Ontario or proposing in Ontario and the
3 gist of it is is that -- their position is that more
4 research is necessary to determine the effectiveness of
5 proposals such as the ones put forward by the Coalition
6 before they can implement them.

7 And my question for you is whether or not
8 you have an opinion as to the advisability of
9 postponing implementation of HSA to a point where this
10 moose habitat research initiative has been completed?

11 A. I'll make an underlying observation
12 before I begin to answer the question. I have been a
13 researcher for 35 years and, fortunately, there are
14 always new questions that we need answers to, we call
15 that sustained yield even flow for a research
16 scientist.

17 There's always more that we need to know,
18 but never in human endeavor have we ceased human
19 activity because we didn't know enough. We always
20 proceed on the basis of what we do know.

21 So I want to make it very, very clear in
22 that facetious remark that I'm all for more research,
23 particularly if it's well guided, well directed
24 research to answer the right questions, I am one
25 hundred per cent in support, and it appears to me that

1 they have intelligently devised a program to go after
2 those questions.

3 But, again, my personal opinion, in the
4 meantime forest management in the Province of Ontario
5 will proceed, as it will in Oregon or Washington or
6 Idaho or British Columbia and we need that long-term
7 vision now.

8 We already know a lot, a considerable
9 amount about ungulates and about moose to begin to move
10 forward from here with a long-term vision.

11 One of the experiences that I've been
12 through recently through my - I'm really only 37 years
13 old, I just look like this. Spotted owls did this -
14 that they have been very clearly pointed out to us now,
15 mathematical operations, what the cost of delayed
16 activity is waiting for additional information.

17 We had enough information to be able to
18 begin to address this question probably a decade ago,
19 had we moved forward at that time we would have been
20 able to adjust with a lot less trouble than we are
21 undergoing at the moment. Essentially we are in a
22 position that is frankly a stunning decision for the
23 nation to have to make. Many billions of dollars, many
24 peoples' jobs, the welfare of a portion of the country
25 and its people, but maybe that is what we're going to

1 do, I don't know, but I know that if we had acted more
2 quickly with a bit more vision without waiting for
3 another \$2-million worth of research, we would have had
4 more options at our disposal to react when the time
5 came and that would have saved both a considerable
6 amount of money and a considerable amount of
7 consternation.

8 Q. I ask you, Dr. Thomas, in hindsight,
9 what it is you're saying that could have been done at
10 some point earlier to help mitigate some of the
11 catastrophic costs that it appears are going to be
12 incurred in western United States as a result of the
13 spotted owl tragedy?

14 A. What are some of them? Essentially
15 we would not have foreclosed options so rapidly and
16 those foreclosure of options in that particular case
17 was the harvest of old growth timber, not quite so
18 evenly distributed across the area of operations.

19 This has led to the point now when
20 adjustment is required. Those persons that -- those
21 portions of the area that had eaten up their options
22 fastest are now the ones that are most dramatically
23 affected. That's just one example, but that's not the
24 one I want you to remember.

25 What I want you to remember is that where

1 you have many options available to you, the retention
2 of options through intelligent habitat analysis and
3 intelligent long-term planning gives one considerably
4 more leeway down line to react to new information or to
5 new facts.

6 Q. Do you have a view, Dr. Thomas, as
7 to - I'm not exactly certain what period you're
8 referring to in terms of the past - but do you have an
9 opinion as to whether or not there would have been
10 sufficient information available at that time in the
11 past to implement a habitat supply analysis and, if so,
12 would that have had any impact on the problems that
13 you're now faced with in respect of the spotted owl?

14 A. We had the ability to do habitat
15 supply analysis. Some very crude ones were done. That
16 did not alter our course of action. We merely said we
17 will wait 10 years, we will have new results at our
18 disposal and there is a probability that those new
19 results will give us information that will make life
20 easier in addressing this problem.

21 We got new information, it did not yield
22 that escape valve, so then we had to come to contention
23 with the issue. But I don't want to dwell on --
24 spotted owl just makes a classic dramatic example, but
25 that's true in all cases.

1 If one projects ahead, says this is a
2 rational, reasonable, conservative course of action,
3 we're going to gather more information, we will alter
4 course if that's indicated farther down line, that's
5 the only thing that I'm saying. Project ahead, have
6 the objectives in mind, pursue a steady, conservative
7 course and be prepared to make adjustments.

8 If one does that, experience says it's
9 apt to save you considerable trauma in the long term
10 and money.

11 Q. You've indicated, Dr. Thomas, that a
12 great deal of research has gone on over the last few
13 years in respect of the spotted owl. Can you tell me
14 what level of uncertainty exists in relation, or
15 regarding the habitat relationships with the spotted
16 owl presently?

17 A. This brings you face to face with the
18 ultimate issue, is that degrees of uncertainties still
19 exist, we will never change them. We now have a
20 long-term view that we've put forward to follow, but
21 that view in itself is what a scientist calls a
22 hypothesis. We think from all the information that we
23 have available we have a management plan that will
24 work.

25 Nobody has ever done this before and

1 we'll probably not get a second chance, so we have to
2 bring all of our information together and we have to
3 hypothesize where we're going.

4 Now, that uncertainty also exists in
5 forestry. I was taught as a young forester forests are
6 an infinitely renewable natural resource. I accepted
7 that absolutely, totally. I still believe that perhaps
8 that's true, but I now know that forest management is
9 agriculture, is fisheries exploitation, all of these
10 things are based on our best information.

11 With the hypothesis of proceeding in this
12 direction we will succeed and we will retain our
13 natural resources. That's all we can do. We must
14 exploit natural resources in order to live, but it pays
15 us to have a long-term vision and be prepared to adjust
16 to new information as we move.

17 MR. MARTEL: It all sounds --

18 DR. THOMAS: Sorry.

19 MR. MARTEL: I said, it all sounds so -
20 I'm implement trying to put the right word on it - and
21 yet despite the best efforts to do that, there's such
22 controversy.

23 DR. THOMAS: That's right. I don't
24 find -- in my youth I used to dream about being able to
25 end controversy, I no longer believe that's possible

1 and out of controversy comes decision, out of decisions
2 come tests, out of tests come alterations. I think
3 that is our course of action in a democracy.

4 And in science, the entire -- scientists
5 are never certain of anything. Somebody said one
6 time - I think one of our presidents - about
7 economists. I need a one-armed economist, I'm tired of
8 these guys telling tell me, on one hand this, on the
9 other hand that, but that's our decision-making
10 process.

11 And, as I said, out of controversy is
12 coming more agreement than you think, because you don't
13 have a decision space as big as this room. The
14 controversy will narrow that decision space down to an
15 area wherein you can make rational decisions that will
16 probably satisfy no one, but if you had a scale of one
17 to a hundred, you're not arguing about options between
18 one and a hundred, you will narrow down through this
19 process, down to options between, say, 40 and 60 on the
20 scale.

21 There lies the possible decision range.
22 So while it appears to be incredibly controversial,
23 that controversy itself begins to define the possible
24 decision.

25 DR. PAGE: I think we're all learning

1 from the spotted owl example, certainly in British
2 Columbia we realize for many of these issues. If we
3 just head a little south of the border we will see our
4 own future, and that's why we've been successful in a
5 cooperative effort for managing British Columbia
6 forests with U.S. Forest Service foresters such as Dr.
7 Thomas and many others from there.

8 And we have a workshop in British
9 Columbia going on through last week now to discuss how
10 we can help resolve each others problems, because we
11 don't have resources to do it all ourselves, and one
12 thing we are learning is to make the hard decisions in
13 anticipation of these boxes, these corners that we get
14 ourselves into.

15 MR. O'LEARY: Q. Moving down the page,
16 Dr. Thomas, to the very last line you state in your
17 paper that:

18 "Forest managers ought to proceed with
19 the keen awareness that there is much
20 that is not known and much that is known
21 that is not completely understood."

22 Can you elaborate a little more on that
23 comment in your paper?

24 DR. THOMAS: A. Yes. I didn't
25 plagiarise the words but stole the idea from one of our

1 famous ecologists that said: Remember, nature is not
2 only more complex than we think, it's more complex than
3 we can think.

4 If you take that to the extreme you say:
5 My God, I'm paralyzed, I cannot move. On the other
6 hand it is probably more complex than we can ever
7 think, but we know a lot, we know a lot from science,
8 we know a lot from experience, we have been practising
9 forestry in the world for a long time and wildlife
10 management, we can begin to bring those things to bear.

11 But what I meant by that was, is we
12 should not be too confident in our knowledge and we
13 should leave some room for error, some ability to
14 adjust. To manage to the wall, you know, throttle to
15 the wall probably doesn't give much slack for
16 adjustment and when one does have to adjust it's very
17 painful, but if there is some slack there and some
18 forecasting and some idea of where we're going, we have
19 a lot better ability to react to surprises.

20 Q. Turning now to the witness statement
21 then, in particular page 9, the end of your response to
22 question 12, and you state in the very last sentence
23 that:

24 "The primary requirement is that both
25 sets of values have equal status and

1 treatment in the timber management
2 planning process."

3 Can I ask you what you mean by equal
4 status and treatment?

5 A. What I meant by that is that if it is
6 a -- when you have a dual objective or multiple
7 objectives each of those objectives are given equal
8 consideration in the decision. It does imply that the
9 decision-maker is then limited to making an equal
10 decision.

11 One could decide to emphasize moose, they
12 could decide to merely maintain enough moose that they
13 would be a part of the system. It does not mean that
14 we can only produce timber at one half of the
15 potential, but it means that in the consideration of
16 what those objectives are and what the possibilities
17 are that they have equal attention. Then one has to
18 decide how the balance will come.

19 There will be an -- I never understood
20 ecology until I read a book that a fellow summed it up
21 for me, he said, there were four of them, four laws,
22 but the two that really made sense to me is
23 everything's got to go somewhere, everything's
24 connected to everything else, and there's no free
25 lunch.

1 Nobody can sit here and tell you that you
2 can have all of everything that you want, that's for
3 the forest, that's for the body politic to decide, but
4 if I do a good job for you as your technical consultant
5 I would be able to tell you that here are your options
6 and if you choose this what the effect here is or
7 there. Then it's the decision-maker's job to pick and
8 choose among those alternatives.

9 Q. Dr. Thomas, do you have a view as to
10 why it's important to give equal status and treatment
11 to timber and non-timber values?

12 A. Because if you do not you cannot
13 provide either the public nor the decision-makers with
14 the appropriate array of information that they need in
15 order to make decisions.

16 Q. Moving now to that portion of the
17 witness statement dealing with balancing flexibility
18 and protection, you indicate in response to question 14
19 on page 10 that, you state:

20 "As I understand the timber management
21 planning process in Ontario at the
22 present time, the detailed spatial and,
23 to a certain extent, temporal pattern of
24 timber management activities within the
25 forest is not decided until after the

1 timber management plan is approved."

2 Can I ask you whether or not you've had
3 an opportunity, Dr. Thomas, to review the Red Lake
4 Timber Management Plan?

5 DR. THOMAS: A. Yes.

6 Q. And have you also had an opportunity
7 to review the various maps that were provided with the
8 that plan?

9 A. Yes.

10 Q. And these are maps that were
11 indicating the location and nature of timber management
12 activities that are proposed?

13 A. Yes.

14 Q. All right. Can I ask you how the
15 level of detail in that plan compares with the detail
16 contained in timber management plans in the United
17 States with which you're familiar?

18 A. The amount of detail is very similar.
19 What's not clear in the plan is how those details
20 satisfy objectives, nor can I tell what the objectives
21 are in terms of other aspects of the plan, but all
22 plans in these forest operations are going to use
23 similar information in a similar way.

24 Q. Thank you. Can I ask you --

25 MR. MARTEL: Could I ask a question

1 there.

2 MR. O'LEARY: Certainly.

3 MR. MARTEL: Is it really a case then,
4 Dr. Thomas, you say the details are quite similar to
5 those that you see in plans in the United States.
6 Where would you alter then to provide -- then you went
7 on to say that it's hard for you to detect the details
8 which satisfy the objectives.

9 DR. THOMAS: All right. The details are
10 there. I have no view of what the long-term vision --
11 the only thing I can see is what's going to happen in
12 terms of the harvest units, I don't know what the
13 long-term future vision is, what's the desired future
14 condition.

15 I can understand what it is in terms of
16 the immediate operation, I can't tell what it is
17 further down line.

18 Now, I don't want that to sound
19 particularly -- we still have some plans just exactly
20 like that in the U.S. Forest Service, more and more of
21 our plans though are moving toward long-term vision or
22 longer-term objective.

23 This is the very common way that things
24 have been universally done for quite a long time. The
25 tools are perfectly rational, the only thing that's

1 missing is the joint objectives clearly stated with a
2 long-term future condition that's forecast.

3 Outside of that, they're quite similar.
4 But as I told you earlier in testimony, we would always
5 use exactly the same tools across North America, both
6 in terms of timber management and in terms of
7 alteration of wildlife habitat. It's how we do it.

8 MADAM CHAIR: Mr. O'Leary, was Dr. Thomas
9 given the 1992-97 Red Lake plan?

10 MR. O'LEARY: Yes.

11 MADAM CHAIR: Thank you.

12 MR. O'LEARY: The one provided by Mr.
13 Freidin.

14 MADAM CHAIR: Mr. Freidin has provided
15 several versions of the Red Lake plan, but the most
16 recent one is the one Mr. Thomas has?

17 MR. FREIDIN: My client has.

18 MR. O'LEARY: It came through you. That
19 was the shining example.

20 Q. Dr. Thomas.

21 DR. THOMAS: A. Let me go a little
22 further with the contrast. There are differences in --
23 some differences in how we manage each side of the
24 border. If we were the Forest Service in the Blue
25 Mountains at the point that they came down to that Red

1 Lake plan we would have what we call - you call them
2 too - an interdisciplinary team, an ID team that would
3 have then sat down at the next level of that plan and
4 considered the cutting units or the treatments coming
5 up in this particular area of treatment.

6 They would have collectively with the
7 wildlife biologists, the silviculturists, the
8 hydrologists, probably a landscape architect concerned
9 about visuals and perhaps other technical specialists
10 that might be involved and sat down and said: How does
11 this go together now to meet the multiple objectives
12 given forth in the plan.

13 So when they came down to actually making
14 the sales and the roads and the decisions on what kind
15 of a road and how much road and whether it would be
16 closed, whether it would be natural regeneration,
17 long-term regeneration exactly, and then possible
18 modifications in the cutting patterns that could
19 possibly occur to achieve those multiple objectives.

20 They would be the ones then that we had
21 to put forth at that point what's called an EIS, an
22 environmental impact statement, and that would be
23 reviewed, be subject to review by the public and
24 subject to appeal if it did not meet the overall forest
25 plan which, of course, had already been approved in

1 terms of meeting the requirements of law.

2 And those appeals do take place and
3 sometimes they're upheld, but those decisions on
4 compliance and flexibility and exactly how they're
5 applied are done by those ID teams.

6 Q. Dr. Thomas, can you tell us
7 specifically how you would use habitat supply analysis
8 tools in the process of developing detailed timber
9 management prescriptions through, as you have
10 indicated, the ID team?

11 A. The HSA - we don't use that word -
12 but that habitat analysis operation would be part and
13 parcel of what comes into the ID team's deliberations,
14 that would be part of it.

15 There would be similar looks at yield
16 tables and that sort of thing from the forestry
17 standpoint, there would be projection models as to the
18 hydrology and the effect on watersheds, all of those
19 would come to bear in those decisions, and each one of
20 them would have to be guaranteed. In the end that
21 decision space starts to narrow down and then they
22 would make a decision that would satisfy the long-term
23 vision put forth in the forest plan, given that
24 analysis of which habitat supply or forecasting of
25 habitat conditions would be part.

1 But there's also similar things done by
2 the hydrologists, by the landscape architect, by others
3 and so that begins to narrow that decision space that
4 Mr. Martel was asking about.

5 Q. Turning now, Dr. Thomas, to page 12
6 of the witness statement in response to question 17 you
7 state that:

8 "Forest Service staff prepare and oversee
9 the implementation of timber management
10 plans."

11 Is there anything further you would like
12 to elaborate on in terms of the role of Forest Service
13 staff in the implementation of timber management plans?

14 A. Very quickly. I mean, there are
15 differences in the United States of how our Crown
16 lands, federal lands are managed. We have no - I have
17 already forgotten the terminology - but we have no
18 concessions to private companies, our foresters put
19 forth management prescriptions and then we put up
20 timber for bid and whoever gets the bid comes in,
21 performs the contract as prescribed by our foresters.

22 And we do have what we call sale
23 administrators or road construction engineers that
24 oversee road construction, they are there on a frequent
25 basis to assure that the contractor meets the

1 specifications of the contract.

2 But the industries foresters, outside of
3 being involved in negotiations over contracts
4 sometimes, they mostly -- there's a considerable amount
5 of forest land in the United States is privately owned,
6 and those foresters are the ones that are in charge of
7 the management of those lands.

8 MR. MARTEL: What goes on there, Dr.
9 Thomas--

10 DR. THOMAS: Sorry.

11 MR. MARTEL: --on the private land in the
12 United States, who does all of the planning, who does
13 the regeneration, who does --

14 DR. THOMAS: On the private lands, all of
15 that is done by private enterprise in terms of -- we
16 have -- basically wood off private lands comes from two
17 areas, one what we call smaller ownerships, privately
18 owned usually, you know, three or four hundred acres or
19 more, we usually call that farm forestry, for some
20 unknown reason, because many times it not related to
21 that at all, but then the larger corporate ownerships
22 exist, particularly in the northern United states and
23 in the southeast, and they have -- many of these
24 companies are extremely progressive, very -- we go
25 there to learn a lot. Some of them have some very,

1 very good wildlife programs.

2 But they are privately managed. Their
3 only constraints are the constraints put forward in
4 forest practices acts by the various states and those
5 vary rather considerably from one state to another. In
6 some states they are very few and very lax; in other
7 states they are very quite an impingement on
8 management, but that varies from state to state.

9 They do have requirements, for example
10 in the state that I live in, they have to have such
11 requirements as reforestation must occur within I
12 believe five years to a certain stocking level, they
13 have to be careful of watershed values, they must leave
14 buffers alongside live streams, and they put together a
15 plan on what they're going to do and then have it
16 approved by the state forester.

17 But it's not a matter of approval of
18 their plan so much as it is that it's in compliance
19 with the law.

20 MADAM CHAIR: Dr. Thomas, we have
21 evidence before us at this hearing that, in fact, the
22 amount of timber that comes off U.S. national forests
23 is less than 30 per cent, closer to 20 per cent of the
24 total demand for wood fiber, something in the order of
25 20 to 30 per cent, and so the question has come up at

1 this hearing about how comparable U.S. national forests
2 are to the Crown timber lands we're looking at because,
3 in fact, you could have the luxury of not producing
4 wood fiber off national forests and you would still
5 have an industry that could support itself obviously on
6 private land.

7 Therefore, the decision to do multiple
8 forestry or to make non-timber values more prominent
9 than timber values is, in fact, available to you on
10 national forests in a way that it isn't apparently so
11 in Ontario.

12 And so we've been discussing that issue
13 to try to resolve in our own minds where Ontario's
14 system of timber management fits in, because it
15 actually falls inbetween your national forests and your
16 private forest lands, I suppose, with respect to the
17 needs to produce both kinds of resources.

18 DR. THOMAS: I can help a little with
19 that I think because one -- first, I don't know if
20 that's an expression in Canadian politics, but in the
21 U.S. we say all politics are local. Timber management
22 decisions --

23 MR. MARTEL: Is that spelled l-o-c-o?

24 DR. THOMAS: Loco, yes. Well, some of us
25 don't talk as good as others. But those decisions are

1 subject to considerable regional differentiation. The
2 underlying laws are the same, but the expectations from
3 the land and the intensity of the management vary from
4 one section of the United States to the other depending
5 on the culture, the tradition, the reliance on those
6 lands.

7 For example, one of the things that's
8 extremely painful in the Pacific northwest due to the
9 present issues is that the timber was removed from the
10 private lands at a rate which we all anticipated would
11 be -- while their timber was coming back we anticipated
12 that that gap would be made up by timber from the
13 public lands, and suddenly those public land timber
14 yields are declining before the private lands are back
15 on line. So there are extreme regional pressures that
16 different -- they're very different from one section of
17 the United States to the other.

18 The other point that I would make is
19 there are some private corporation lands in the United
20 States that, in my mind, are as well managed for joint
21 production of wildlife and forest as the public lands
22 and they are becoming -- many of those companies are
23 becoming more and more conscious of the desire or the
24 advisability of joint production.

25 One, in some cases they make money out of

1 it; in other cases they gain considerable goodwill out
2 of it; and, thirdly, they recognize it as good business
3 to have the American people convinced that they are
4 doing a fine job of management of their lands, and
5 they're doing a good job of convincing the American
6 public and I think, in many cases, justifiably so.

7 MR. O'LEARY: Q. Dr. Thomas, perhaps I
8 could just put a small hypothetical to you. If in the
9 United States there was a similarity in terms of the
10 extent of public lands as there is in Canada, or at
11 least Ontario in respect to Crown lands, would have
12 done things any differently in terms of implementing
13 the HSA; in other words, if the situation had been
14 different than as described by Madam Koven, would you
15 have delayed implementation of the HSA or done anything
16 differently than you have done at the present time?

17 DR. THOMAS: A. No, I don't think so.
18 I'm not sure that's the point that the Chairperson was
19 making but, no, given the circumstances that exist and
20 the compliance with the laws in the United States and
21 public desire and essentially, to be truthful, a long
22 losing streak in the federal courts, we were adjusting
23 as necessary in order to be able to proceed with
24 achievement of our forest management objectives. I
25 think it was more driven by those circumstances than

1 ownership pattern.

2 MR PATCH: A. I too would like to add to
3 that. There's a discussion between what we have as
4 objectives or expectations from public lands versus
5 private and then a separate discussion on the tools
6 that allow you to quantify the tradeoffs.

7 And I think that from a New Brunswick
8 context, that's quite a Canadian context, that there
9 are public demands and expectations in terms of
10 multiple benefits or products that people expect from
11 their public lands, and I think one of the laws Dr.
12 Thomas referred to earlier is that there's no free
13 lunch.

14 So that if we're going to manage for a
15 variety of products, we can't expect the same flow for
16 any one individual product, or it's unlikely or
17 unreasonable to expect it.

18 I think clearly that one of the public
19 expectations is and should be that timber production is
20 essential, it's an essential part of our economy and
21 society and that one objective is to manage Crown lands
22 to maintain a viable industry.

23 Now, the idea of certain tools like we're
24 talking about, we already impose on Crown land
25 management systems in Canada certain constraints or

1 areas you can't harvest or different types of
2 strategies that result in ultimately reducing the
3 timber supply or area that's available, and when we're
4 talking about habitat supply analysis tools we want to
5 do two things, we want to make -- well, what is the
6 tradeoff in the cost projected as a result of applying
7 those things, and also how does that relate to what the
8 habitat will look like in the future.

9 So we're looking at setting objectives,
10 seeing whether they can be attained, and also being
11 able to make an assessment as to which alternative
12 should be made, and that won't reduce necessarily
13 conflict but it will get out in the open what is the
14 reason that you apply certain guidelines. Well, that's
15 to produce this much habitat.

16 Can you produce or predict as a result of
17 applying those guidelines that you will or will not
18 meet that objective for habitat. Well, with these
19 tools I can assess that.

20 What is the cost of applying that in
21 terms of a potential reduction in annual allowable cut
22 from a particular area. Well, it may be this amount.
23 Okay, the decision-makers now have a basis to make a
24 more informed decision and make a choice.

25 MR. O'LEARY: I'm just about to move into

1 another subheading of the witness statement, I thought
2 it would be appropriate to break now.

3 MADAM CHAIR: Why don't we take our
4 afternoon break, Mr. O'Leary. We will be back in 20
5 minutes.

6 ---Recess at 2:35 p.m.

7 ---On resuming at 2:55 p.m.

8 MADAM CHAIR: Please be seated.

9 MR. O'LEARY: Thank you, Madam Chair.

10 Q. Dr. Thomas, I am now turning to the
11 heading Habitat Supply Analysis at page 13 of the
12 witness statement and in your response to paragraph 19
13 you state at the bottom:

14 "In order to establish wildlife
15 population objectives in timber
16 management plans it is necessary,
17 therefore, to set out explicitly all
18 underlying assumptions regarding other
19 aspects of population dynamics so that
20 the performance of timber management
21 activities over time can be fairly and
22 unequivocally evaluated."

23 Can I ask you to expand on what you mean
24 by this?

25 DR. THOMAS: A. Very obviously if you

1 have -- your objectives have got to be set two ways,
2 one's a habitat objective and one's what one expects to
3 result from the habitat.

4 And the reason that I put that forward,
5 the timber manager or the forester, wildlife biologist
6 combination in this particular case can meet the
7 objective in terms of the habitat objectives and the
8 populations may vary, so essentially one has to be
9 aware that there are other aspects, particularly in
10 what we call featured species management, the
11 production of animals for surplus for hunting, that
12 those populations will, can and do vary affected by
13 hunting regulations, by predators, if they exist, by
14 unusual levels of weather, those things have to be
15 understood and considered as well.

16 But the two aspects is the habitat which
17 can be met and the other, what you expect to come from
18 it, but you expect variability in that other output
19 which is the production of the animals.

20 Q. Again in that same quotation you say:
21 "...to set out explicitly all underlying
22 assumptions..."

23 Can I ask you, how explicit is it
24 necessary to be in setting out these assumptions?

25 A. It's necessary to put forth the

1 assumption, as somebody said one time, you need to be
2 careful with assumptions. For example, one of our
3 plans that I had the other that I was sent to review I
4 sent it back and I didn't review it outside of the
5 first page. They said: Well, you're sloughing off.
6 And I said: No, I don't agree with assumption 1 on
7 page 1 so, therefore, there is no point in reading the
8 rest of the plan.

9 That assumption was there would be no
10 fire and there would be no catastrophic insect
11 outbreak, which was counter to experience that we had
12 undergone.

13 So, therefore, it's necessary to set
14 forth the assumptions so the evaluator can decide
15 whether the remainder of the plan -- or plan, whether
16 it's a wildlife plan, timber plan or whatever, is
17 reasonable.

18 Q. In terms of the evaluation
19 subsequently in terms of whether or not you have
20 achieved the objectives, can I ask you from a practical
21 perspective how is it possible to measure the results,
22 whether or not you have achieved these objectives?

23 A. The first level of monitoring is
24 compliance monitoring; in other words, did the managers
25 carry forth the plan, was it actually put in place as

1 prescribed, which is a performance criteria, and many
2 times they won't be, but it can be explained why, and
3 that's perfectly reasonable. But the first is
4 compliance monitoring. We set you forth upon agreement
5 to do this thing, did you indeed do it.

6 The next level of monitoring is a little
7 longer and it says: Did you get the result that one
8 would anticipate. Now, that one gets to be tricky
9 because let's say if we had an elk output objective and
10 it was stated precisely as a fact that the output
11 objective for elk was to maintain a population of
12 20,000 animals. If one set out to determine whether or
13 not one was producing precisely 20,000 animals per year
14 that's obviously not achievable.

15 However, the objective can be monitored
16 or measured in the terms of trends, it can be measured
17 in terms of staying within certain bounds of providing
18 "x" amount of hunter days, or "x" amount of hunter
19 success. There are a number of ways that the
20 objectives can be put forth and measured or in some
21 combination of the above.

22 But it's frequently put forward in such a
23 discussion as this as, well if you cannot monitor the
24 elk products of the east slope of the Blue Mountains,
25 you want 20,000, if you can't tell me I've got 20,000,

1 you obviously can't do it so, therefore, it's all over.

2 No. There are all kinds of levels of
3 measurement that can be done. Most commonly in
4 wildlife operations it's a matter of trend. But let's
5 move away from an animal like an elk or a moose, move
6 to martens.

7 My God, it would be a whole lot harder --
8 I mean, who can see a marten from a helicopter, but one
9 can know what one assumes to be marten habitat is, one
10 can visit 10 per cent of those habitat areas you expect
11 a marten in and sample to see indeed whether there's
12 one there.

13 It's not very hard to tell if there's a
14 marten there. It may be very difficult to see the
15 animal, but it's not difficult to tell if it's there or
16 not.

17 The next level --

18 Q. How is that, can I ask you how?

19 A. You can do it from -- primarily we do
20 it, at least, from snow tracking. We can even go to a
21 great detail less than that in research of smoke plates
22 and footprints and a whole bunch of other things. But
23 basically if we wanted to know if there were martens in
24 our marten area, we would go out and look when there
25 was snow on the ground on 10 per cent of the area. If

1 90 per cent of those had martens in them we would
2 expect that we were performing as we anticipated. In
3 some cases just presence or absence is adequate.

4 So there's all kinds of levels of
5 monitoring detail that can be set up once one
6 understands the objective.

7 Q. My next question is following along
8 the lines of our discussion now in respect of one of
9 the featured species that the Coalition has put forward
10 as being appropriate and that's the pileated
11 woodpecker.

12 And ask the panel, I'm not sure if it was
13 Dr. Page, if you're the appropriate one, how do we
14 measure for pileated woodpeckers? Is there any
15 practical means to see whether or not we have achieved
16 our objectives in respect of that featured species?

17 DR. PAGE: A. Not only are the means
18 practical, but I've already used them in Ontario. For
19 three of the summers that I was working here I was
20 conducting research with Harry Lumsden of Natural
21 Resources in the Elk Lake area on golden eyed ducks.

22 Golden eyed ducks nest in cavities in
23 trees that they can't dig themselves, they have to rely
24 on other animals, and primarily pileated woodpeckers.

25 So each spring we would hike transects

1 along the edges of the lakes and stop occasionally and
2 listen. Pileated woodpeckers in the springtime drum on
3 logs, the males do, to display, to make sounds so that
4 other males know where they are and to attract females
5 and that's a relatively easy method of censusing those
6 animals, getting an index to how many of those birds
7 are around there.

8 It's also a case where just about
9 anybody, once you identify what it is, can identify the
10 sound of a pileated woodpecker hammering at that time
11 of the year on a tree. They choose trees that are
12 particularly resonant, they're loud, and because
13 they're so big they drum fairly slowly compared to
14 other woodpeckers that would drum more rapidly.

15 And I think for most of the species that
16 we're interested in, once you understand them, a method
17 like that of inventory can be devised that can give you
18 the appropriate level of knowledge you need, as Dr.
19 Thomas mentioned.

20 Q. Dr. Thomas, I would now like to take
21 you to your --

22 A. Mr. O'Leary?

23 Q. Yes, Dr. Page.

24 A. I was just allowing the Board there
25 to -- the other method, of course, is to count the

1 holes, like counting the tracks, the other method with
2 the pileated woodpeckers is to count the holes, and
3 that's something that can also be done feasibly in
4 timber cruising or many other methods.

5 MADAM CHAIR: One matter that was before
6 the Board, Dr. Page, has to do with setting numerical
7 targets for wildlife populations, and Dr. Thomas
8 commented on that this morning with respect to perhaps
9 setting a range of 10- to 15,000 or 25,000 moose that
10 you want to produce in a certain area.

11 Do you think it's feasible at all to have
12 a numerical target for something like the pileated
13 woodpecker?

14 DR. PAGE: Oh yes, certainly, and I would
15 say that presence/absence could be conceived as the
16 simplest numeric target. To make it artificially
17 precise though would not be appropriate.

18 For example, a thousand plus or minus 10
19 per cent pileated woodpeckers in a forest management
20 area would be an artificial level of precision, so the
21 inventory, you know, the precision whether you've
22 achieved your objective would far outweigh the
23 requirement in that particular case.

24 So I think it's necessary to set targets
25 that are quantified so you know whether you've achieved

1 them or not, but also to ensure they're appropriate.

2 MR. MARTEL: When you say quantified, I
3 mean, that becomes the operative word and what
4 specifically does one mean when one says you have to
5 quantify what's there?

6 DR. PAGE: I would say the way I used it
7 when I say quantify, it's not just enough, or saying
8 that we have to provide some habitat, it has to be a
9 level that -- you know, presence/absence clearly, as I
10 said, is the worst possible, the lowest possible
11 modification level, but if you had some information,
12 say, on these different kind every drumming counts in
13 areas where the habitat was adequate, you then can use
14 that as an indication that if you hear a certain number
15 of birds you can be certain that you have achieved your
16 objectives.

17 DR. THOMAS: We deal with -- probably the
18 best expert in the United States on pileated
19 woodpeckers works on my staff, Dr. Evelyn Bull and
20 she's worked on pileateds, oh, nearly 18 or 19 years
21 now, but basically in some of our timber management
22 plans or forest management plans it would be stated as
23 we want to retain "x" number of nesting pairs or
24 nesting habitats per unit of area.

25 Because these animals are so easy to see

1 whether they've been there, if you're in a pileated
2 woodpecker territory you neither have to hear them,
3 which they are - they also have a very raucous loud
4 call, or they have the springtime territorial drumming,
5 but they also feed in a certain mechanism where they
6 literally tear dead logs and dead trees apart. It's
7 quite easy to go into habitat that is set aside or
8 manufactured for them and determine whether it's indeed
9 the centre of an activity pair.

10 So in that case the quantified objective
11 is "x" number of occupied territories per unit of area,
12 and they will not -- this is great rocket science, this
13 is real biology.

14 They nest off the ground, ordinarily
15 about 40 feet off the ground and the diameter of the
16 tree at that point has to be a certain size and the
17 science behind this is that their fanny is about that
18 wide and they're about that long and the tree has got
19 to be that big for them to get in there to dig a hole
20 that will hold them.

21 So you will not have pileated woodpeckers
22 nesting in stands that have trees in there that have no
23 trees greater than 12 inches dbh. So we have some idea
24 of what the habitat requirements are, what they look
25 like, we produce those through silviculture and then we

1 look and see if there's a pileated woodpecker there.

2 You don't look at all of them, you look
3 at a sample and if that sample -- say 60 per cent of
4 such areas were occupied at the sample time, that could
5 be a quantifiable objective.

6 The point that I'm trying to make is that
7 quantifiable does not necessarily mean I put my eyeball
8 on 20,000 elk. It could be that track counts
9 maintained themselves on so many tracks crossing a
10 migration road or road across a migration path at so
11 many per unit mile of transect.

12 It could be that I fly the same transect
13 lines each year and count the elk and that we want to
14 retain that as 500 encounters in that transect. We can
15 tell whether they're going up or down.

16 One of the false assumptions in wildlife
17 has always been that you have to have exact precision
18 to deal with the question, and you do not. You can
19 still have quantifiable objectives but they don't have
20 to be direct counts within plus or minus five per cent.

21 MR. O'LEARY: Q. Thank you, Dr. Thomas.
22 Could I turn you now to your paper under Tab 15 of the
23 witness statement and, in particular, Roman numeral
24 (xx) which is the second page, and in the fifth
25 paragraph down right toward the end you state in part

1 that:

2 "It was still obvious that part of the
3 problem was that wildlife biologists
4 were, in general, ill disposed and poorly
5 equipped to play effectively in planning
6 and allocation games that required the
7 expression of information and concepts
8 in the form of models."

9 Can you explain to us what you mean by
10 biologists were ill disposed and poorly equipped in the
11 context of that paragraph?

12 DR. THOMAS: A. There are a number of
13 biologist that are ill disposed to do that because in
14 order to model and present your ideas in terms of
15 models you have to state very explicitly what you think
16 makes the system -- makes that system run.

17 Many biologists are not disposed to want
18 to do that, they would rather walk in the room wave
19 their arms around and say: I don't want you to put
20 this timber cut here, I don't like this, that or the
21 other. Why. Well, just because that's not good
22 wildlife management.

23 And the guy says: Well, what do you want
24 me to do. Well, I don't know, but I don't want you to
25 do what you're doing. So it's a matter of being forced

1 to precisely state what they want and what they expect
2 the outcome to be.

3 Now, that is ill deposition. Ill
4 disposed is the fact that most biologists consider - we
5 have a lot of people, Dr. Page is one that's
6 mathematically expert - most biologists are not
7 particularly inclined to be mathematical whizzes and
8 they visualize modeling as being an incredibly
9 difficult mathematical exercise. It can be, not
10 usually however, a model can be -- if you ask me, how
11 does elk habitat work, tell me in words, I could draw a
12 model of it in words without mathematics.

13 If we have empirical data that will lend
14 to the use of mathematics, then we can do that, but
15 biologists have conceived of this as being extremely
16 difficult in a mathematical sense.

17 Lastly, they have not been conditioned to
18 think of it in that manner of being a production, they
19 think of wildlife as something that naturally and
20 normally occurs and should be handled with constraint;
21 in other words, don't do it, rather than saying, if we
22 do such and such a thing, what would we expect to have
23 occur.

24 Q. In that same passage, Dr. Thomas, you
25 use the words planning and allocation games. Can I ask

1 you what you mean by those words?

2 A. I don't mean that it's a frivolous
3 pasttime, I mean that the engagement in the game of
4 planning, which is - one of the dictionary definitions
5 of games, I believe, is an interplay, an interaction,
6 how does one play in that game - particularly it's an
7 apt use of the word if you assume that the people
8 sitting around the table are competitors as opposed to
9 cooperators.

10 How do I get what I want, how do I retain
11 my prerogatives, as opposed to a more open manner of
12 saying, we have joint products, how professionally will
13 we cooperate to achieve that end. But a game is merely
14 an interaction of human beings to reflect an outcome.

15 Q. Dr. Thomas, perhaps I could ask you,
16 the title of the paper is Wildlife Habitat Modeling,
17 Cheers, Fears and Introspection. Can you tell us a
18 little more about the group that you were writing to or
19 speaking to. In the first paragraph you make reference
20 to a conference.

21 A. Yes, this was a conference in '84,
22 1984 held in California, it was an international
23 conference in order to bring together what was known at
24 that time about the application of detailed modeling
25 exercises to deal with wildlife and wildlife habitat.

1 I believe, if it's not already taken
2 place, there's another one to take place shortly called
3 2001

4 DR. PAGE: A. That was this past summer.

5 DR. THOMAS: A. This past summer. See,
6 I haven't read it yet. But the point that comes from
7 those two things is that skills and techniques in this
8 particular field are expanding at a very, very rapid
9 rate. I'm sure the proceedings of Wildlife 2001
10 compared to the one of 2000 seven years earlier will be
11 dramatic in terms of the development of the
12 understandings, the techniques, and the mechanics of
13 doing such things.

14 Q. Thank you. In the very next
15 paragraph on page Roman numeral (xx) you state:

16 "Although much information was available
17 on the relationships of vertebrate
18 wildlife species to habitat conditions,
19 it was diffuse, diverse and difficult to
20 consider in land use planning."

21 Can I ask you whether or not - and I may
22 have done this already - but have you had an
23 opportunity to examine the moose habitat guidelines in
24 Ontario?

25 A. Yes.

1 Q. All right. And do you have an
2 opinion, Dr. Thomas, as to whether or not these
3 guidelines provide sufficient information on the
4 relationships of moose to habitat conditions in a form
5 that is equipped for planning and the allocation
6 requirements for timber management in Ontario?

7 A. No. The information is there, it's
8 an admirable job of beginning -- of collecting and
9 trying to synthesize the information, but as far as it
10 goes is to the development of a set of guidelines which
11 are essentially short term - and I've done a lot of
12 those myself, I'm not deriding that - but we should be
13 able to move beyond that at the moment to the statement
14 of some vision of future habitat condition.

15 Q. All right. Moving now to page Roman
16 numeral (xxi), at paragraph 3 you discuss some of your
17 fears -- actually I should refer you back to paragraph
18 2 where you discuss some of your fears with modeling
19 and, as an example, you provide the story of a meeting
20 where -- and this is the beginning of the third
21 paragraph, you state:

22 "I tried to engender some discussion
23 about the assumptions of the linear
24 programming model, the confidence
25 limits around each of the variables

1 considered...", and so on.

2 Can I ask you whether or not the
3 information that you attempted to engender some
4 discussion about was ever ultimately presented in that
5 meeting?

6 A. No. The point that I was trying to
7 make was that the meeting that I described was at a
8 meeting of rather high-powered administered in the U.S.
9 Forest Service and we technical types were standing
10 there going through a considerable description of
11 analyses that we had performed that were largely in the
12 timber arena, some in the wildlife arena, and everyone
13 was standing there going like this.

14 Q. Nodding their heads.

15 A. Nodding their heads up and down in
16 agreement, and as I looked at them I suddenly realized
17 that they didn't understand what had come out of that
18 black box.

19 They hadn't asked any questions about
20 what the assumptions were, they had not asked any
21 questions about certainty, how sure are we of the
22 outcome, and I felt compelled to make a short speech,
23 which I thought was quite clear and erudite, then they
24 looked at me and smiled and went right back to the
25 discussion.

1 But the point in that is that modeling,
2 forecasting, habitat assessment or habitat forecasting
3 models or timber forecasting models are necessary,
4 they're a view of the future, but they need to be
5 viewed with caution, that's why we have to monitor and
6 why we have to come back and reconsider and re-adjust
7 periodically.

8 Q. In that same quotation you make
9 reference to confidence limits around each of the
10 variables. And my question is, do you have a view as
11 to the reasonableness of providing confidence limits
12 and, if so, what would they look like?

13 A. Confidence limits can be set in a
14 number of ways. They can obviously be computed. If
15 one has empirical one can compute confidence intervals
16 and what that means is, if I said I'm dealing with a 95
17 per cent limit plus or minus 10 per cent, it would mean
18 that unless a five per cent chance has occurred outside
19 that limit the true meaning lines within 10 per cent
20 one way or the other of the mean.

21 One can do that mathematically. One can
22 also state that in a qualitative sense I am quite sure,
23 for example with the spotted owl plan, it was
24 quantitative, there was absolutely no way we could
25 compute mathematically a probability of success. What

1 we used was a group of experts and said: If we do
2 this, we are highly -- we have a high probability of
3 success.

4 So probability statements can be made
5 with an expert system, which is really just a group of
6 people sitting down that are indeed expert, considering
7 the information and making such a statement or
8 preferably, it can be computed from empirical data but,
9 in many cases, that data doesn't exist in that form.

10 Q. Then in the next paragraph on page
11 again Roman numeral (xxi), starting with the second
12 sentence, you state that:

13 "I do believe that people who produce and
14 use models have the responsibility to
15 explain processes, assumptions, strengths
16 and weaknesses to those who make
17 decisions based on those models."

18 Can I ask you why you feel that is
19 important?

20 A. Unless things are put forward in such
21 a manner the people that have to make decisions and
22 report to the stockholders, which in the case of public
23 land is to the public, they have no understanding of
24 what degree of risk or what degree of certainty is
25 involved in those decisions. They're entitled to know

1 those things and one of the ways to get the best feel
2 for it is to go through that list of attributes that I
3 described in that sentence.

4 Q. All right. Then if we move on to
5 page Roman numeral (xxii) where you talk about the
6 cubing problem and the limitations of our knowledge of
7 wildlife.

8 Where you talking about the cubing
9 problem and the limitations of our knowledge of
10 wildlife habitat relationships. In paragraph 4 you
11 draw an analogy with white water canoeing and conclude
12 that:

13 "Perhaps we need to slow down a bit and
14 steer a bit more carefully and
15 methodically."

16 In the context of this passage, what is
17 your view as to whether or not we should use habitat
18 supply analysis models in timber management planning
19 before we have greater confidence in their
20 relationships and effectiveness?

21 A. I believe we have no alternative but
22 to proceed with management both in forestry and in
23 wildlife management, and that passage was merely meant
24 to indicate that one can fool themselves by developing
25 very sophisticated models.

1 As Dr. Page said earlier about OCCAM's
2 razor, it's pointless to do more when you can do with
3 less. In short, if your understanding is very
4 rudimentary and very basic, you base your models being
5 very basic and very rudimentary. You don't leap to the
6 edge of multi-factorial models which appear to be very
7 sophisticated but perhaps are quite misleading. We
8 need to stick with the things that we know the most
9 about, either in terms of expert opinion or in terms of
10 empirical information.

11 Q. Now, you've indicated earlier that
12 the conference was held in 1984, Dr. Thomas, and I ask
13 you whether or not you believe there's been any change
14 in the status and use of habitat supply analysis within
15 the mainstream of wildlife biology since this
16 conference?

17 A. Yes. This was not mainstream at the
18 time that it was done. If you begin to classify
19 professionals by age group, this is certainly
20 mainstream for the younger professionals coming out of
21 school now. They're also quite in tune and a number of
22 them have been hired because they're quite in tune with
23 the planning requirements, at least in the United
24 States, that promote the use of models and
25 consideration of multiple outputs and shared

1 objectives.

2 There are a number of older folks, you're
3 never too old to learn, but if they want to be on the
4 cutting edge in what's going on in terms of planning
5 and forecasting, it's important that they understand
6 these things.

7 However, I would make the point, for
8 example, I did not claim to be an expert on modeling,
9 but I've learned enough about modeling and I've learned
10 enough about system analysis, et cetera, that I can
11 understand how it works, I understand how to make it
12 work, but when I want to make it work I call the fellow
13 up from the basement out of the computer shop who comes
14 up and we sit down and decide what it is we want to do
15 and he goes and does it.

16 I am not particularly fascinated by the
17 insides of a computer, but I do need to know how it
18 works, what I can expect from it.

19 Q. Thank you. Turning over to page
20 (xxiii) then, at the end of the third paragraph you
21 state there, and I believe you're referring to wildlife
22 biologists:

23 "Their professional welfare and survival
24 depends on what they must know about
25 modeling. Survival is the most powerful

1 incentive."

2 Can I ask you, Dr. Thomas, what you mean
3 by those two sentences and perhaps if you had an
4 example of that you could share it with the rest of us.

5 A. Yes, I had a twofold intent when I
6 made that statement. When I meant survival, I didn't
7 mean that you were going to die, or perhaps that the
8 biologists would lose their job, but I meant if they
9 want to be in an influential position to influence the
10 management of forest as it's evolving in the United
11 States, they had better be able to deal with their
12 colleagues in forestry and hydrologists, et cetera, in
13 these kind of analyses and projections.

14 The second one I meant could be expanded
15 to the agency. If one looks at forestry, the practice
16 of forestry world wide we have lost rather dramatically
17 over the past decade or so. I think most social
18 commentary in this regard is unanimous in terms of
19 public confidence. I think that is too bad and that we
20 must leap forward to regain that confidence of the
21 public, and I think this is one mechanism whereby we
22 may do that, or at least that is where the bets are,
23 that's where the action is, and unless we are prepared
24 to deal at this level of planning and forecasting in an
25 interdisciplinary fashion, I don't think that our

1 chances to recoup our reputation are that good.

2 Q. In the very next paragraph towards
3 the end you state:

4 "If inability to understand or apply
5 modeling exists and persists among state
6 biologists, it must inevitably lead to
7 their increasing ineffectiveness,
8 frustration, alienation and conflicts
9 when dealing with federal agencies."

10 A. Yes.

11 Q. Do you have anything you would like
12 to add to that?

13 A. First, I have to explain that in the
14 United States the U.S. Forest Service is responsible
15 for habitat, we are not responsible for animal
16 regulation of setting hunting seasons or trapping
17 regulations, et cetera, that's done by the states.

18 So there's -- in our operation the states
19 must cooperate in that planning process and in how
20 those things are used.

21 Because they work for an agency that does
22 not put a considerable amount of value on that, the
23 federal biologist are becoming more and more adept at
24 it and they are lagging behind and the fact that they
25 share wildlife responsibility with the federal agency,

1 I'm very concerned that they're effectiveness and
2 influence in how we manage our land is diminishing
3 because of their inability to deal with the new
4 technological aspects of planning and forecasting and
5 resource allocation.

6 Q. All right. Do you have an opinion as
7 to whether or not the terms and conditions of the
8 Coalition as identified in Exhibit 1637 address, in any
9 way, the concerns that you've just expressed orally and
10 those that we have just referred you to in your paper?

11 A. In the sense of, I think some
12 attention to education or continued training is
13 certainly one. The other I believe is the assurance
14 that professionals that are brought on from this point
15 forward are indeed qualified to deal with these
16 matters.

17 Q. Thank you. Now, at the bottom of
18 page (xxiii) you make reference to a common view held
19 by researchers regarding results of their studies and
20 you suggest that:

21 "They often add a caveat that additional
22 research is required and more information
23 will emerge in due time. Certainly this
24 information should not be applied in
25 management."

1 You then continue on at page (xxiv) and
2 indicate that:

3 "This does not occur in the real world
4 and it would be preferable if researchers
5 adopted attitudes evidenced by statements
6 such as 'It is an imperfect and uncertain
7 world but here is some information that
8 you may be able to use. The information
9 is not as good as I would like, I expect
10 to have more and better information
11 later. In the meantime, it is the best
12 available, its strengths are and such and
13 such and its weaknesses are so and so'."

14 Can I ask you what the relevance is of
15 this to the matters before the Board in this hearing?
16 What are you trying to say?

17 A. Yes. The point that I was making, as
18 a researcher I don't really expect you to go and read
19 the Journal of Esoteric Results, as I spend my time
20 doing, but merely every research paper will end up with
21 a statement such as that one.

22 'This is interesting, we did the best we
23 could but we were limited on money and
24 the study only went three years, so I
25 really would'nt pay any attention to

1 this if I were you but I'm going to do
2 some more research and I'll be back to
3 talk to you later.'.

4 And I assure you in the next paper it
5 will say the same thing. Well, that gets the
6 researcher off the hook for anybody paying any -- you
7 know, for the consequences of paying any attention to
8 what we might have to say. But nobody ever pays any
9 attention to that. We desperately need information to
10 move forward in management and we're going to reach
11 down there, if you're a manager, we're going to reach
12 down there, take that information, and put it it to
13 work.

14 I was merely saying that we need to
15 understand that, and that researchers themselves need
16 to understand that their information will be put to
17 use, and instead of making that excuse, turn around and
18 say: Yeah, I think this can be used, or to participate
19 in the development of the techniques, tools,
20 synthesized information that's necessary to move on.

21 But the primary point of it is, is we
22 always operate on the basis of what we have available
23 to us at the moment. We can want more information; in
24 fact, most researchers lust in their heart after more
25 information, but ultimately human beings act now on the

1 basis of what they know now.

2 DR. PAGE: A. In the case of our
3 research programs in British Columbia those ideas have
4 been accepted as givens now, that information cannot be
5 collected for its own sake, if the communications and
6 implementation plans are not part of the initial
7 research scheme, then they will not be approved for
8 funding, and we can't wait until the completion of a
9 five-year research program before we begin
10 communication, we have to start with that at the
11 beginning.

12 So, in many cases, we develop our support
13 for the research initiatives by talking to the people
14 that will be using the information that we are trying
15 to develop.

16 DR. THOMAS: A. I would make one
17 additional point in terms, as a research scientist the
18 most exciting thing that I see come out of this sort of
19 thing is that it is what we call a problem analysis, it
20 is the absolutely ultimate problem analysis.

21 We lay forward the framework that we
22 intend to use, we're going to proceed from this point
23 forward, where are the weak points, where are the real
24 touch points that need attention.

25 Now, that's got two attributes to it.

1 One is it's a way to work on the right things and, to
2 be perfectly frank about it, it's the thing to go to
3 the administrator with and say I want to work on it
4 because it's important to you, and he has a little bit
5 more -- he or she has a bit more interest in those sort
6 of things.

7 Q. Thank you. Moving down to the second
8 half of page Roman numeral (xxiv) in your paper, you
9 describe, Dr. Thomas:

10 "The course of events leading up to the
11 implementation of new technology and
12 the chaos associated with its
13 implementation."

14 You use the term in the second last
15 paragraph:

16 "Noise and clutter associated with
17 applying these tools in a management
18 context...", and you state that:

19 "One solution may be to develop and test
20 habitat relationship models using
21 standardized habitat variables, land
22 units and relationships."

23 You go on to say:

24 "A persual of the pertinent literature
25 indicates that, for forest habitats at

1 least, this could be done. To the extent
2 possible, these variables should be
3 expressed in a form that is or could be
4 collected by forest survey crews."

5 Could you please elaborate on those
6 comments for me?

7 A. Yes. This goes back to the idea that
8 I was telling you earlier, that the standard tools in
9 forestry, both in terms of measurement and in terms of
10 manipulation of stands to produce wood products, are
11 precisely the variables a habitat manager would use,
12 perhaps with some modification. Much of the
13 information collected is also applicable.

14 We go back, for example - I'm trying to
15 remember, on a 10-year, I don't know whether that's
16 right or not - but about a 10-year basis for resurvey
17 both on private lands and on public lands. We have
18 already begun to alter what our survey crews are
19 collecting.

20 For example, there was never any interest
21 in the past in them collecting information on standing
22 dead trees, we weren't going to make boards out of them
23 after all, why would we care, it's going to fall down.
24 They now tally dead trees because they are habitat for
25 cavity nesting birds.

1 They also tally understory vegetation
2 which is forage for deer or for elk. They tally dead
3 and downed woody material on the ground that they did
4 not tally before. They tally stand size, distance to
5 edges, juxtaposition, classification to the next
6 adjacent stand, all of these things which are
7 meaningful in the wildlife sense which can be gathered
8 by those crews.

9 As close -- there is a - I'll look it up
10 later - but there is a table in that Wildlife Habitat
11 in the Blue Mountains book that I gave you that makes
12 the point that wildlife managers and foresters all
13 learn the same thing in school, they just put different
14 names on it. So I will look it up and give you the
15 table in a minute.

16 But the point being is, is as soon as we
17 can make our language common, talking about the same
18 things, utilize the same databases, the same mechanism
19 of collecting information, the more quickly we can come
20 on line with better habitat forecasting and assessment
21 capability and the closer we can talk to our brethren
22 in the forestry community about joint products.

23 We are in the same business after all, we
24 use the same information, we certainly are using the
25 same land base for joint production, and that was what

1 I was speaking of.

2 Q. Thank you. I have one further
3 question in this area of your witness statement, that
4 is, based upon your understanding of the terms and
5 conditions of the Coalition, do you have a view as to
6 whether or not they are consistent with your views as
7 expressed in your evidence in respect to the
8 development and implementation of habitat supply
9 analysis?

10 A. They should do that job, yes.

11 Q. Now moving on to page 16 of your
12 witness statement under the heading Information
13 Constraints, and in response to question 25 in the
14 fifth paragraph you indicate that:

15 "There is evidence to suggest that man's
16 activities in the forest can have long
17 lasting and irreversible ecological
18 effects."

19 I think you've indicated earlier a
20 reference to the spotted owl, but do you have any other
21 examples of that?

22 A. Oh, there are. If you want to look
23 at world-wide examples, there are areas in Greece,
24 Lebanon, the perimeter of the Mediterranean, one might
25 argue whether that's climate alteration or

1 inappropriate forest practice, but those were forested
2 at one time. In fact, there are monuments in Lebanon
3 that overlook the goat slopes and say, These Forests
4 Are Under The Protection Of The Emperor. So world wide
5 there certainly has been large-scale deforestation.

6 We have areas in the United States, say
7 in southern Oregon, where we removed old growth forest
8 on south facing slopes and have been unable to
9 satisfactorily regenerate those sites after 10 to 15
10 years.

11 If we lose species to extinction we
12 obviously -- that's an irreversible ecological effect,
13 we have in the forests in the United States, I forget,
14 some several hundred plants that are on the verge of
15 extinction and several hundred animals that we feel are
16 approaching extinction level.

17 Q. Now, your response, Dr. Thomas, to
18 question 25 deals with the inescapable uncertainty
19 associated with timber management planning and that
20 decision-makers must be aware of how little is known
21 and the high cost of being wrong.

22 Can I ask you, what information do you
23 believe should be made available to decision-makers so
24 that a responsible decision can be made?

25 A. Obviously we bring to their attention

1 in a capsulized form the underlying ecological theory,
2 the capsulized or synthesized empirical information,
3 the synthesis of professional opinion, and the results
4 of modeling.

5 Now, I didn't mean to say we're totally
6 obsessed by what we do not know because I've already
7 said we know a lot more than sometimes we pretend to
8 know, and very often when you ask a single
9 professional, what's this relationship, and he says, we
10 don't know, that's a wrong answer because perhaps
11 someone else does.

12 We know a lot more collectively than any
13 of us know individually, but the point of it is we
14 bring the data to bear and then we appropriately
15 caution the decision-maker about the possibilities
16 involved in that decision of being wrong.

17 Q. All right. Well, can I ask you, if I
18 put you in the place of the decision-maker and you were
19 told that information was not available or that there
20 was only one alternative possible, can I ask you what
21 your response as the decision-maker would be in that
22 situation?

23 A. Well, I can visualize in some cases
24 there might be a circumstance where there's one
25 alternative available, but I can't think of one off the

1 top of my head. Usually there are a considerable array
2 of alternatives available, in fact, an infinite
3 variety.

4 However, what we do is the same thing I
5 was telling Mr. Martel later, that infinite variety is
6 somehow handled and that's by bringing that decision
7 space down in terms of what's politically, socially,
8 economically and ecologically feasible.

9 Then there are alternatives within that
10 array, and each one of those alternatives will have
11 different ramifications, different levels of assurance
12 of meeting joint production, and each one of them will
13 have associated costs, and that's what the
14 decision-maker needs to know and that's what the
15 landowner needs to know in order to make appropriate
16 decisions.

17 Q. Can I ask you, Dr. Thomas, what at a
18 minimum in the United States in terms of alternatives
19 must be considered?

20 A. I know that in our law we are
21 required to always analyse what we call a no-action
22 alternative, what happens if you do nothing at all.
23 I'm not sure that's required in law, but our standard
24 planning operations usually has the no-action
25 alternative and then there is usually five other

1 alternatives put forward, and that's usually an array
2 from a low timber yield to a high timber yield, from a
3 low wildlife, high, so one begins to look at the
4 tradeoffs and compromises.

5 Q. Now, presuming that you had all of
6 the information that could be made available with the
7 resources provided, how do you propose that this
8 information could be used to arrive at a decision?

9 A. One looks at the joint outputs that
10 would be required and the underlying constraints, and
11 some of those constraints are put forward by law, in
12 our country at least, you must at least manage at this
13 level, you cannot do such and such to a watershed, you
14 must maintain all species viably distributed and so on.

15 You would bring that, you would make sure
16 that you met those underlying requirements and then you
17 would lay forward the alternatives.

18 For example, as the aftermath of the old
19 growth issue in the Pacific northwest, Congress
20 commissioned four of us to lay out their alternatives
21 to look at in terms of dealing with old growth forest
22 habitats. We laid out 14 alternatives for them running
23 from historic levels of timber production, all the way
24 up to one tenth of that much and all along that 14
25 alternative array was the probabilities of survival of

1 the spotted owl, of other old growth associated
2 species, of the impacts on jobs, on local communities,
3 on fisheries, so they could look all along that array
4 and find out at which point they wanted to operate and
5 then they could look at that and say: Okay, this has
6 these costs associated with it and it has these
7 benefits associated with it.

8 In some cases we could not meet the
9 requirements of the law in various alternatives and
10 that was pointed out, but laws can be changed.

11 So that was the point. The congressman
12 asked me: What decision should we make? And I said:
13 Sorry, I'm not in the decision-making business. He
14 didn't offer to let me run for his seat, so I suppose
15 they will make the decision.

16 Q. Turning to question 26 at page 17 of
17 the witness statement, Dr. Thomas, you state in the
18 first full sentence that:

19 "Habitat supply analysis models are
20 intended to capture much of the
21 professional judgment that forest
22 managers possess."

23 Can I ask you to please elaborate on
24 that?

25 A. Yes. There is a tendency to either

1 make too much or too little of professional judgment.
2 In the sense that it would not be satisfactory to me as
3 a decision-maker if you just brought me in and said:
4 What's your opinion as to the consequences of such and
5 such an action? It would be okay. I don't think
6 that's good enough.

7 However, I think it's perfectly
8 acceptable for you to ask me to come in as a
9 professional, study the situation, lay out the
10 empirical information, the underlying ecological
11 theory, the consequences of decision, the level of
12 certainty, the explanation of the risk, based on a
13 combination of professional judgment, the empirical
14 data, modeling and underlying theory.

15 Once I had described that to you I would
16 think that I had done my job, and professional opinion
17 is part of that.

18 In the end all judgment is professional
19 opinion. There is no management plan -- for example, a
20 fellow stood up in front of Congress and waved a copy
21 of that owl report and said: We argued about whether
22 this was good science. It was not science at all, it
23 was a management plan. Science was what built the
24 building blocks that went into the plan, but ultimately
25 the plan was professional judgment, as all plans are.

1 Q. Moving on to page 18 and your
2 response to question 28, you state at the bottom of
3 your response that:

4 "The adaptive management approach is an
5 effective strategy to maximize the
6 knowledge that we gain from our mistakes
7 and to reduce the risks of local
8 management activities causing
9 irreversible long-term ecological
10 harm."

11 Can I ask you, how can the adaptive
12 management approach reduce the risk of long-term
13 ecological harm if it requires 80 or a hundred years,
14 whatever the rotation is, or more for these effects to
15 become apparent in timber management?

16 A. It doesn't take that long for effects
17 to become apparent. For example, in one of our study
18 areas we're dealing with soil compaction. We know from
19 intentionally impacting soil to a very high level that
20 we get an inability to grow trees, we get J-rooted
21 trees, we can't get natural seeding; and we have
22 control areas where we've never had any soil
23 compaction.

24 We are able to judge in each entry which
25 we can simulate what the degree of increasing soil

1 compaction per entry is. That's just one example.

2 Nutrient loss is another one that we are
3 studying. They can be studied along a continuum and
4 one can project into the future. You don't have to --
5 ultimately it would be like, what's the consequences of
6 putting a human being on a 1,500 calorie diet starting
7 at age 12. One would not have to wait until they were
8 rotation age at 85 to understand that you get kind of
9 skinny when you eat 1,500 calories a day - which some
10 of us probably ought to do.

11 In other words, you don't have to wait
12 for the end result, one can see progression along a
13 continuum that would give you a warning light to say:
14 Look, we have to make an adjustment here. The effects
15 don't have to take a hundred years to be seen.

16 Q. Thank you, Dr. Thomas.

17 A. That is what monitoring is all about.

18 Q. Turning now to the portion of the
19 witness statement dealing with professional
20 certification which begins at page 20, I would like to
21 take you to page 21 and your response to question No.
22 33 where you state that:

23 "There is a need for wildlife habitat
24 prescriptions in timber management plans
25 to be developed by a certified wildlife

1 biologist."

2 Now, other parties I understand have
3 proposed that the planning team comprise forest
4 ecologists, plant botanists and a variety of other
5 specialists dealing with non-timber biological
6 resource.

7 Do you have a view as to whether or not
8 these additions to the planning teams are necessary?

9 A. I can tell you what our experience is
10 in the United States. We do not have a specified group
11 of people that would make up an ID team, even though
12 they are almost always made up of a forester, an
13 engineer, a wildlife biologist, more and more
14 frequently now they contain a botanist because of the
15 Endangered Species Act and surveys for threatened
16 plants, but the number, the kinds of people involved
17 will depend on the circumstances of the area involved.

18 For example, if it were an area that we
19 knew we were apt to have trouble with soil stability,
20 there would probably be a soil scientists on the ID
21 team; if it was an area where we knew had rare plants
22 in it, we would probably have a botanist.

23 So those teams change, but they nearly
24 always include a wildlife biologist and a forester.
25 Well, I don't -- I would not want to necessarily

1 exclude anyone from being on those teams, it would
2 depend on what the circumstances were to be analysed
3 and so on.

4 Q. All right.

5 A. And certainly the forester and the
6 wildlife biologist, if they are playing the game fairly
7 and objectively, would quickly recognize whatever
8 talents they needed to bring to bear on the question.

9 Q. I ask you, Dr. Thomas, whether you
10 have a view as to the need for professional
11 certification of the professionals on the team?

12 A. I was present at the Wildlife Society
13 when certification was developed. We saw a need for it
14 in the United States. There are some states that now,
15 while they do not require certification, require that a
16 person be eligible for certification; in other words,
17 they make the standard for employment the same.

18 I think certification is a good idea. It
19 can be accomplished a number of ways. It can be done
20 by a professional society, that's one set of
21 certification requirements. It can be done with civil
22 service requirements, provided they are strict enough.
23 However, we have been concerned -- I have at least
24 personally been concerned that in later years we have
25 thrown some people into the breach on these questions

1 that are not well trained or well prepared to serve in
2 that capacity.

3 Q. Do you have any examples of that, Dr.
4 Thomas?

5 A. Yes. We have thrown some people onto
6 ID teams who come out of school recently with a degree
7 in zoology, for example. Quite well trained zoologist,
8 but absent training in plants, absent training in
9 forestry, absent training in soils, absent training in
10 hydrology, absent training in the rules, regulations
11 and laws applicable to the situation and while they
12 might be very fine biologists were essentially lost in
13 the give and take and melee of the situation.

14 Wildlife nor the land was served well, in
15 my opinion, in that circumstance.

16 Q. Mr. Patch, I wonder if I could turn
17 to you and ask whether or not you have an opinion as to
18 the need for professional certification of wildlife
19 biologists?

20 MR. PATCH: A. Well, I feel quite
21 strongly that if you're going to employ people to do a
22 certain function they should meet educational
23 standards, and in looking at the team that's been
24 involved in developing the habitat supply analysis in
25 New Brunswick, I was involved in recruitment of that

1 team and all the people that are involved in the
2 program and have been through the past, meet the
3 eligibility criteria for certification, and that was
4 one aspect looked at in terms of our criteria for
5 recruitment of staff.

6 Q. Dr. Page, do you have a view?

7 DR. PAGE: A. Yes. I am a registered
8 professional biologist in British Columbia, which is
9 the equivalent of certification there, and the
10 Association of Professional Biologists, of which I am
11 member, is a agency that performs the certification.
12 There's no legal requirement for biologists performing
13 these kinds of duties with the government to be
14 certified.

15 As Dr. Thomas has stated, it's become in
16 fact a requirement for hiring, so that the job
17 descriptions now say there is a requirement to be
18 eligible for certification in the association to
19 compete for these positions.

20 Because of that, I believe the number now
21 is roughly 80 per cent of all the biologists that are
22 in the civil service already are a member of our
23 association. If they already were employed and it was
24 not a requirement for them, they have voluntarily
25 become members and have become certified, and because

1 it is a requirement I'm not aware of any biologist
2 having been hired in the last two years that have not
3 been certified.

4 In conjunction with that, I think Dr.
5 Carr mentioned the presence of preharvest silvicultural
6 prescriptions in British Columbia, that before a stand
7 is harvested requires certain activities to be
8 identified and the impact of those activities to also
9 be identified, and one of the impacts is -- one of the
10 questions that -- a subject area is, is there any
11 impact on wildlife. The assumption, again, is that
12 those areas will be signed off by a biologist, but
13 there's no requirement currently for that topic to have
14 been addressed by a biologist. That may become a
15 requirement in law as well as in practice.

16 MADAM CHAIR: Dr. Page, how many wildlife
17 biologists are practising in the area of forestry in
18 British Columbia?

19 DR. PAGE: Well, I had the difficulty
20 with the association, once we became the Association of
21 Biologists as opposed to fisheries and wildlife
22 biologists initially. With that definition, we could
23 define biologists but we had a difficult time being
24 able to essentially legally define when someone becomes
25 a fisheries or wildlife biologist.

1 So the definitions that we have now are
2 broad enough to include botanists and potentially
3 zoologists, who may or may not be management oriented
4 specialists, but they have the management -- we are
5 required to meet a certain minimum standard, more
6 than -- the majority of the biologists in the province
7 in any capacity had to be certified in order to join
8 the association before the association could achieve
9 legal certification.

10 So we have already achieved that. More
11 than 50 per cent of all biologists and, as I said 80
12 per cent in the province, and I think our membership
13 now is about 650 and with biologists in training and
14 lapsed membership I believe it approximates 800 or so.

15 MADAM CHAIR: And how many biologists are
16 employed by either the Ministry or Department of
17 Forestry?

18 DR. PAGE: Well, the Ministry of Forests,
19 it's fairly recent the way they've had people employed
20 specifically as biologists, so we have many, many
21 members who have received their training in schools of
22 forestry, they're officially classified as foresters
23 though they're trained in wildlife management not in
24 forestry, I suspect it's about 10 per cent are jointly
25 both.

1 We have now decided to have a regional
2 wildlife habitat ecologist in each of our regions in
3 the forest service. So to answer your question, we
4 have a large number of biologists, but only roughly
5 eight people, other than those in the research program,
6 are acting officially as biologists in their position,
7 though we have many biologists that are acting as
8 foresters.

9 MR. MARTEL: Is there a biologist on
10 each unit?

11 DR. PAGE: Each region.

12 MR. MARTEL: For example, we have 100
13 forest management units.

14 DR. PAGE: Yes.

15 MR. MARTEL: Are you suggesting we need a
16 biologist on every FMU or FMA?

17 DR. PAGE: I would not suggest that.

18 MR. PATCH: A. In New Brunswick in my
19 region there's one regional wildlife biologist. We
20 have as an assistant a contract employee hired to
21 assist in implementation of habitat supply analysis, so
22 there are two biologists in the wildlife end of it with
23 our department that are working on this program.

24 In our region we have -- contain three
25 different FMA areas and a portion of the fourth that we

1 administer.

2 MR. MARTEL: And you have two biologists?

3 MR. PATCH: Yes.

4 MADAM CHAIR: And you said you have four
5 regions in New Brunswick?

6 MR. PATCH: Five.

7 MR. MARTEL: And two biologists.

8 MADAM CHAIR: So you have fewer than a
9 dozen wildlife biologists who are involved in the HSA?

10 MR PATCH: Yes. It would be about that
11 number. There's a central planning team that are
12 working on the development of habitat relationships, on
13 the coordination element to train people, and then
14 there are the people working in the application out in
15 the regions.

16 MR. MARTEL: In this jurisdiction we have
17 a hundred units. How could you possibly -- and let us
18 say we do a plan, we do one-fifth of those annually,
19 because it's a five-year plan, so you get 20 plans.

20 How would you ever achieve in that size
21 of a jurisdiction having people in place to work on all
22 of the plans that are going out?

23 I guess my concern is, when I look at
24 Europe and how many people are involved in forestry and
25 they're much smaller, and I look at northern Ontario

1 and I see the vast, you know, from the Quebec border to
2 the Manitoba border which is probably 12- or 1,300
3 miles between the 50th parallel and down to Algonquin
4 and Minden, what do you -- when do you reach a point
5 that you have the bodies there but there's simply too
6 much work and too much expanse and too much territory
7 to look after it realistically.

8 I mean, just because of the sheer volume
9 of size that doesn't give somebody an opportunity to
10 get out in the field and be there or -- I mean, one of
11 the complaints we hear is that they're diluged with
12 paper and it becomes a paper war, and I think most
13 foresters would tell you, they don't feel comfortable,
14 they don't feel they get out as much as they should.

15 And I guess my colleague and I are trying
16 to grapple with the type of staffing that's required to
17 do -- you could do a super job if money was limitless,
18 but to do a job that's necessary. I mean, you look at
19 some of these areas, just how big can it be before it
20 becomes too big to do competent work either by the
21 biologist or the forester, or put it another way: Do
22 we need a biologist and forester really in each unit,
23 just for openers, across the province?

24 DR. THOMAS: My opinion is, yes, you do,
25 and I don't want to mislead you. When you do this kind

1 of work and with more intensity it requires more
2 people. Of course you run up against the limit very
3 quickly of what you can afford very obviously, but one
4 of the things that we have run into is that, you know,
5 kind of a smart alec remark, but pay me now or pay me
6 later. We found that inadequate staff on the ground
7 led us to non-compliance with the law, got us out of
8 sinc with what the people wanted and we ended up in
9 trouble and then had to try to run to catch up, and so
10 it was a matter of whether we wanted to try to get
11 ahead of it or whether we wanted to try to chase the
12 problem.

13 But I would certainly say one forester,
14 of course, I don't know what this means to you, but to
15 us -- we essentially have a forester, a wildlife
16 biologist, a hydrologist, a soil scientist, an
17 archaeologist, a botanist on each one of these areas at
18 a minimum, some of them more, depending on the crunch
19 that is on them.

20 And, of course, they complain that that's
21 not adequate, that each one of them needs an assistant
22 of course. I don't know that you ever achieve that,
23 but the point is...

24 MR. MARTEL: Well, we certainly could
25 reduce unemployment.

1 DR. THOMAS: Certainly reduce
2 unemployment or build it, I'm not sure which. Maybe
3 the consequences of what they do would increase it, I'm
4 not sure, but the point that I'm making is that as we
5 go at these things on the initial surge - that's been
6 true in the U.S. - there was a time when every one of
7 these areas that I'm describing to you now that there
8 is a full staff of maybe 60 or 70 people, when I first
9 came into the service 25 years ago there was three or
10 four or five, but we weren't very active, we weren't
11 entering those areas yet, the timber programs were just
12 building up and the consequences of having to be able
13 to account for these things.

14 Being in a relatively low profile
15 maintenance position is not very expensive; moving to
16 really full-scale coordinated management when you're in
17 a fully managed forest circumstance, usually builds up
18 your staffing requirement, or leads to a diminution of
19 what one would expect them to produce.

20 I am very sympathetic to the paper war.
21 I'm not so sure that this is - I'm pretty sure that in
22 my own mind this is not the best way to assure things.

23 When I gave a talk at the Forestry
24 Congress up here by invitation several years ago and I
25 said: God, I wish I could go back in the United

1 States, eyeing my fellow professionals, I wish we could
2 go back 20 years and try to get ahead of this rather
3 than dragging our feet and having the worlds descend on
4 us.

5 Not only when it descended on us did they
6 begin to pass considerable legislation that's
7 incredibly difficult for us to deal with, it also has
8 removed many of our professional prerogatives, that I
9 think jointly, as professionals, we could have done a
10 better, more coherent job of addressing the questions
11 had we chosen to do it that way instead of waiting
12 until the law came down on us and the people came down
13 on us and we've been deeper in paper ever since.

14 MR. PATCH: I think I'd like to point out
15 in terms of our senior regional wildlife biologists,
16 they were in place doing other duties related to
17 wildlife management in the region, and the numbers I
18 gave you weren't totally incremental as a result of
19 HSA.

20 And also the fact that while we certainly
21 did make a commitment, make an investment in people to
22 develop the program in New Brunswick, that that
23 developmental group served the whole province out of
24 one area.

25 MR. MARTEL: Yes. That's what I'm trying

1 to get at, you're talking about a specific program that
2 you developed over time. I'm trying to get a handle,
3 you have 10 units.

4 MR PATCH: Yes.

5 MR. MARTEL: And how many do you have
6 servicing -- how many biologists do you have servicing
7 each unit, how many foresters' and so on, because the
8 imbalance. I think -- if you look at it, if you don't
9 have the balance in terms of experience and skills, the
10 potential for going one way or the other might become
11 much greater. In other words, you might focus more on
12 fiber or you might focus more on -- you naturally have
13 a forester, but certainly I think that's a fear that
14 people have had and has been expressed to us, that you
15 go this direction because you don't have maybe the same
16 expertise or sheer numbers.

17 And that's what I was trying to get a
18 handle on, how many you have and I think my colleague
19 was trying to get from Dr. Page their experience,
20 because certainly we have heard that cry here.

21 DR. PAGE: I would love to have the
22 resources in British Columbia so we could have an equal
23 number of foresters and biologists and ecologists in
24 all units.

25 We are attempting to get more of the

1 biological information into the planning teams. The
2 initial way to do that is to ensure that there is
3 some -- a biologist sits on the planning team, but that
4 biologist may sit on a very large number of those
5 teams, puts that biologist in a difficult position,
6 that is preferable than completely ignoring some areas.

7 MR. MARTEL: Yes, sure. Put in those
8 terms, yes.

9 DR. PAGE: Another small step.

10 MR. O'LEARY: It might be an appropriate
11 time --

12 DR. THOMAS: I guess the statement that
13 we've used over and over and over when we've had to
14 face these things is, it's a joke, but it's kind of an
15 identification joke, we step forward one more time into
16 the breach to have to do something we're not equipped
17 to do or manned to do and we say: Well, we've got to
18 do the best we can with what we've got.

19 And that's what we do always, here,
20 there, everywhere, you do the best you can with what
21 you've got, but sometimes you've got to quit doing one
22 thing in order to do another, or you've got to do less
23 of it to do more of something else.

24 MR. PATCH: I was going to add that it
25 becomes a matter of priorities in allocating resources.

1 MR. MARTEL: Sure.

2 MADAM CHAIR: All right. Thank you very
3 much, gentlemen. That will finish today's session and
4 we will be back at nine o'clock tomorrow morning.

5 ---Whereupon the hearing was adjourned at 4:10 p.m., to
6 be reconvened on Wednesday, February 19th, 1992,
commencing at 9:00 a.m.

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